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From the Secretary of the Society
Sept., 1892 -

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34TH ANNUAL REPORT

OF THE

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STATE HORTICULTURAL SOCIETY

OF THE

STATE OF MISSOURI

1891

MEETINGS AT

ST. JOSEPH, JUNE 2, 3, 4, AND SEDALIA, DEC. 1, 2, 3, 1891.

L. A. GOODMAN,

Secretary, Westport, Mo.

JEFFERSON CITY, MO.:

TRIBUNE PRINTING COMPANY, STATE PRINTERS AND BINDERS.

1892.

MISSOURI STATE HORTICULTURAL SOCIETY.

To His Excellency, DAVID R. FRANCIS :

This report of our society work, of the meetings held, of the moneys expended, and of the local societies and counties reporting for the year 1891, is respectfully submitted.

L. A. GOODMAN, Secretary,
Westport, Mo., 1892.

CITY OF JEFFERSON, February 5, 1892.

To the Commissioners of Public Printing :

I require for use of Horticultural Society 3,500 copies of report of State Horticultural Society, 2,000 copies bound in cloth, 1,500 in paper, which I desire printed as per accompanying sample.

Respectfully,

L. A. GOODMAN,
State Secretary.

Approved :

A. A. LESUEUR, Secretary of State. }
J. M. SEIBERT, State Auditor. } Commissioners of Public Printing.

OFFICERS FOR THE YEAR 1892.

PRESIDENT,
J. C. EVANS, North Kansas City.

VICE-PRESIDENT,
N. F. MURRAY, Oregon.

SECOND VICE-PRESIDENT,
SAMUEL MILLER, Bluffton.

SECRETARY.
L. A. GOODMAN, Westport.

TREASURER,
A. NELSON, Lebanon.

LIST OF HONORARY MEMBERS.

Miss M. E. MURTFELDT	Kirkwood, Mo.....
GEORGE HUSSMAN.....	Napa, Cal.....
T. T. LYON.....	South Haven, Mich...
C. W. MURTFELDT.....	Kirkwood, Mo.....
Hon. N. J. COLMAN.....	St. Louis, Mo.....
JOHN BURE.....	Leavenworth, Kas ...
SAMUEL MILLER	Bluffton, Mo.....
HERMAN JAEGER.....	Neosho, Mo.....
Prof. M. G. KERN.....	St. Louis, Mo.....

LIST OF LIFE MEMBERS.

J. C. EVANS	North Kansas City Mo
L. A. GOODMAN	Westport, Mo.....
D. M. DUNLAP	Fulton, Mo.....
D. A. ROBINETT.....	Columbia, Mo.....

STANDING COMMITTEES.

Orchards.

W. G. GANO, Olden; J. A. DURKEE, Weston; HENRY SPEER, Butler.

Vineyards.

G. E. MEISSNER, Bushburg; JACOB ROMMEL, Morrison; C. TRUBNER, Lexington.

Small Fruits.

S. MILLER, Bluffton; J. N. MENIFEE, Oregon; HENRY SCHNELL, Glasgow.

Stone Fruits.

G. W. HOPKINS, Springfield; F. A. HUBBARD, Carthage; J. A. LOGAN, Nevada.

Vegetables.

H. T. BURRIS, Clinton; W. A. SMILEY, Boonville; E. S. LAIR, Springfield.

Flowers.

H. NIELSON, St. Joseph; R. S. BROWN, Kansas City; E. H. MICHEL, St. Louis.

Ornamentals.

Prof M. G. KERN, St. Louis; C. H. FINK, Lamar; R. E. BAILEY, Fulton.

Entomology.

Miss M. E. MURTFELDT, Kirkwood; Dr. A. GOSLIN, Oregon; G. B. LAMM, Sedalia.

Botany.

Prof. H. W. SPECKING, South St. Louis; Prof. G. C. BROADHEAD, Pleasant Hill; B. F. BUSH, Independence.

Nomenclature.

D. A. TURNER, St. Joseph; J. B. WILD, Sarcoxie; A. AMBROSE, Nevada.

New Fruits.

F. LIONBERGER, Hugo; A. H. GILKESON, Warrensburg; W. P. STARK, Louisiana.

Ornithology.

Prof. L. T. KIRK, Sedalia; C. W. MURTFELDT, Kirkwood; W. H. THOMAS, La Grange.

Injurious Fungi.

B. T. GALLOWAY, Washington, D. C.; Prof. W. TRELEASE, St. Louis.

Packing and Marketing Fruits.

E. T. HOLLISTER, St. Louis; C. C. BELL, Boonville; C. THORP, Weston.

CONTSITUTION

OF THE

MISSOURI STATE HORTICULTURAL SOCIETY.

ARTICLE I. This association shall be known as the Missouri State Horticultural Society. Its object shall be the promotion of horticulture in all its branches.

ART. II. Any person may become a member of this society upon the payment of one dollar, and membership shall continue upon the payment of one dollar annually. The payment of ten dollars at any one time shall constitute a person a life member, and honorary members may be elected at any regular meeting of the society. And any lady may become a member by giving her name to the secretary.

ART. III. The officers of this society shall consist of a president, vice-president, second vice-president, a secretary and a treasurer, who shall be elected by ballot at each regular annual meeting, and whose terms of office shall begin on the first day of June following their election.

ART. IV. The elective officers of this society shall constitute an executive committee, at any meeting of which a majority of the members shall have power to transact business. The other duties of the officers shall be such as usually pertain to the same officers of similar organizations.

ART. V. The regular meetings of this society shall be held annually on the first Tuesday in December and June, except when otherwise ordered by the executive committee. Special meetings of the society may be called by the executive committee, and meetings of the committee by the president and secretary.

ART. VI. As soon after each regular annual meeting as possible, the president shall appoint the following standing committees, and they shall be required to give a report in writing, under their respective heads, at the annual and semi-annual meetings of the society, of what transpires during the year of interest to the society: Orchards, Vineyards, Stone Fruits, Small Fruits, Vegetables, Flowers, Ornamentals, Entomology, Ornithology, Botany, Nomenclature, New Fruits, Injurious Fungi, Packing and Marketing Fruit.

ART. VII. The treasurer shall give a bond in twice the sum he is expected to handle, executed in trust to the president of this society (forfeiture to be made to the society), with two or more sureties, qualifying before a notary public, of their qualifications as bondsmen, as is provided by the statute concerning securities.

ART. VIII. This constitution may be amended by a two-thirds vote of the members present at any regular meeting.

LIST OF COUNTY SOCIETIES.

Adair County Horticultural Society—
 R. M. Brashler, Pres't, Kirksville.
 E. A. Patterson, Sec'y, Kirksville.
Atchison County Horticultural Society—
 C. W. Coe, Pres't, Tarkio.
 R. Lynn, Sec'y, Tarkio.
Barry County Horticultural Society—
 M. H. Roberts, Pres't, Golden.
 G. G. James, Sec'y, Exeter.
Bates County Horticultural Society—
 C. I. Robards, Pres't, Butler.
 Henry Speer, Sec'y, Butler.
Barton County Horticultural Society—
 C. H. Fink, Pres't, Lamar.
 D. B. Hayes, Sec'y, Lamar.
Buchanan Co. Horticultural Society—
 D. A. Turner, Pres't, St. Joseph.
 C. McKann, Sec'y, St. Joseph.
Butler County Horticultural Society—
 D. C. Kitteridge, Pres't, Poplar Bluff.
 E. R. Lentz, Sec'y, Poplar Bluff.
Camden County Horticultural Society.
 J. W. Burhans, Pres't, Stoutland.
 J. D. Reagan, Sec'y, Stoutland.
Cooper County Horticultural Society—
 H. M. Myers, Pres't, Boonville.
 C. C. Bell, Sec'y, Boonville.
Greene County Horticultural Society—
 J. Kirchgraber, Pres't, Springfield.
 G. W. Hopkins, Sec'y, Springfield.
Henry County Horticultural Society—
 M. L. Bonham, Pres't, Clinton.
 J. M. Pretzinger, Sec'y, Clinton.
Holt County Horticultural Society.
 N. F. Murray, Pres't, Oregon.
 S. Blanchard, Sec'y, Oregon.
Mound City Horticultural Society—
 D. B. Browning, Pres't, Mound City.
 J. M. Hasness, Sec'y, Mound City.
Howell County Horticultural Society—
 W. G. Gano, Pres't, Olden.
 Will. George, Sec'y, Olden.
Jasper County Horticultural Society—
 B. Hall, Pres't, Carthage.
 Z. T. Russell, Sec'y, Carthage.

Tri-county Horticultural Society—
 S. M. Hood, Pres't, Searcoole.
 J. Carnahan, Sec'y, Searcoole.
Lafayette Co. Horticultural Society—
 Dr. W. A. Gordon, Pres't, Lexington.
 C. Teubner, Sec'y, Lexington.
Laclede County Horticultural Society—
 A. Nelson, Pres't, Lebanon.
 E. B. Kellerman, Sec'y, Lebanon.
Lawrence Co. Horticultural Society—
 J. B. Logan, Pres't, Marionville.
 B. Logan, Sec'y, Marionville.
Linn County Horticultural Society—
 Ralph Smith, Pres't, Brookfield.
 G. W. Martin, Sec'y, Brookfield.
Livingston Co. Horticultural Society—
 G. W. Weatherby, Pres't, Chillicothe.
 M. L. Brooks, Sec'y, Cavendish.
Mercer County Horticultural Society—
 H. R. Wayman, Pres't, Princeton.
 J. A. Kennedy, Sec'y, Ravenna.
Montgomery Co. Horticultural Society—
 F. Gutmann, Pres't, Hugo.
 C. Hausser, Sec'y, Hugo.
Pettis County Horticultural Society—
 G. B. Lamm, Pres't, Sedalia.
 L. T. Kirk, Sec'y, Sedalia.
Polk County Horticultural Society—
 G. W. Williams, Pres't, Humansville.
 J. L. Strader, Sec'y, Humansville.
Phelps County Horticultural Society—
 Robert Merriwether, Pres't, Rolla.
 W. W. Southgate, Sec'y, Rolla.
Ripley County Horticultural Society—
 J. G. Hancock, Pres't, Doniphan.
 T. W. Mabrey, Sec'y, Doniphan.
Saline County Horticultural Society—
 J. T. Stewart, Pres't, Blackburn.
 Thos. Adams, Sec'y, Marshall.
Vernon County Horticultural Society—
 A. Ambrose, Pres't, Nevada.
 J. G. Kinder, Sec'y, Nevada.
Missouri Valley Horticultural Society—
 J. C. Evans, Pres't, Harlem, Mo.
 G. E. Rose, Sec'y, Rosedale, Kas.

SEMI-ANNUAL MEETING

HELD IN

ST. JOSEPH, JUNE 2, 3 AND 4, 1891.

(Y. M. C. A. BUILDING.)

As usual, the Society met with a full attendance and a full program. The enthusiasm of the Missouri horticulturists knows no limits. The members began to collect and arrange the hall on Tuesday morning, and by the time of the opening of the evening session the hall was beautifully decorated with plants from the green-houses of Hans Nielson, and the tables were filled with the finest strawberries ever seen. There were some thirty or forty varieties, and they were as large as ever are seen.

The local society deserves much praise for their complete arrangements and grand way of providing for the Society and its members.

Many apples were on the tables—some kept by the Secretary in cold storage, and others kept by Conrad Hartzell by his plan of keeping fruit.

Taking it altogether, the hall and the surroundings made a very pleasant home for the Society for the three days of sojourn.

More than a hundred delegates were present from different parts of the State, and it is with a good deal of satisfaction that we see men leaving their business for the purpose of seeking knowledge and giving information.

FIRST DAY.

TUESDAY, June 2, 8 P. M.

The evening program was carried out fully and was a foretaste of what was to come.

Music—Instrumental Duet, by Misses Purviance and Stoddart.

Opening Prayer—Rev. Mr. Martin.

Music—Song, Miss Florence Hitt.

Welcome Address—By the Mayor of St. Joseph.

Response—By J. C. Evans, President.

Dumb Bell Drill—Primary class Martin Institute.

The Fruit Industries of Our State—N. F. Murray, Oregon.

Song—Master Charlie Guthrie.

The Florists and their Growth in Missouri—Hans Nielson, St. Joseph.

Recitation—Miss Martie Martin.

Some Lessons Learned from the Farmer—Mrs. Helen Laughlin, College Springs, Iowa.

Address—By Capt. Posegate.

The following is from the St. Joseph Herald:

The Missouri State Horticultural society met yesterday in the Y. M. C. A. hall in semi-annual session. About fifty delegates from a distance and the same number of local members were present, but owing to the delays in the arrival of the trains from the south, President J. C. Evans, of Harlem, and Treasurer J. H. Logan, of Nevada, and all the delegates from Clinton, Nevada, Springfield, Warrensburg, Sarcosie, Lamar, Carthage, Sedalia and other points in Southern Missouri, and the exhibits they will bring, did not arrive in time for yesterday's sessions, and the appointment of the various committees was postponed until to-day.

Secretary L. A. Goodman, of Kansas City, and Vice-President N. F. Murray, of Oregon, Mo., were present yesterday.

The display of strawberries and apples is quite extensive. Every variety of strawberry known is on exhibition, and when the delegates arrive, the fruit they bring with them will add largely to the exhibition. The stage of the hall was beautifully decorated with pot plants presented by Hans Neilson.

The following members of the Society had exhibits: H. D. Korf of St. Joseph, ten varieties of strawberries; J. T. Mider, Wathena, Kansas, strawberries; D. A. Turner, twenty-four boxes of strawberries; G. Segessman, Amazonia, apples and berries; W. S. Fugate and J. W. Arthur, of this city, strawberries; Judge Samuel Miller, of Bluffton, Mo., twenty-seven varieties of strawberries; Conrad Hartzell, city, apples; L. A. Goodman, Kansas City, twenty varieties of apples.

THE EVENING SESSION.

In spite of the extreme heat, the opening session of the Missouri State Horticultural society at the Y. M. C. A., music hall, was largely attended. The front seats were occupied by the delegates to the meeting, while the other seats were taken by citizens of St. Joseph.

The program opened with a piano duet by Misses Purviance and Stoddard. Prayer was then rendered, after which a solo by Miss Florence Hitt was given.

Mayor Shepherd then welcomed the delegates to St. Joseph, and extended to them the liberty of the city.

The President of the Society, J. C. Evans, of Harlem, Mo., responded to Mayor Shepherd's address, making a neat little speech. He said that one of the chief objects of this meeting was to make arrangements for displaying horticultural exhibits from Missouri at the World's fair.

A dumb-bell exercise by six little misses was next. A number of very difficult movements were gone through with perfectly, showing that the children had been well trained. The girls were Misses Elvie Eckles, Minnie Wheeler, Jennie Roy, Jessie Roberts, Ella Boyd and Georgie Potter. Accompaniments on the piano and anvil were played by Misses Maggie Martin and Florence Hitt. The exercise was received with applause, and an encore was responded to.

ADDRESS BY THE PRESIDENT, J. C. EVANS, HARLEM.

After seven years missionating over the State, the Society comes again to meet with the good people of St. Joseph.

We come to you the same old Missouri Horticultural society, with many of the same old faithful members, who were here seven years ago, and many new ones, who have fallen into line from time to time and become valuable workers.

The Society has seriously felt the loss of some of its most valuable members, who were here then and who since that time have been called hence.

It might interest some of you to know what the Society has been doing these seven years and what good has been accomplished by the members. Meetings have been held at Springfield, Butler, Lexington, Louisiana, Boonville, Nevada, Warrensburg, Lebanon, Poplar Bluff, West Plains, Brookfield and Clinton.

These meetings have encouraged the organization of local societies in various parts of the State, secured the co-operation of many of the best and most practical fruit-growers, who have rendered valuable aid in carrying on the work of the Society, and have been the means to induce the planting of more and better fruits, flowers and ornamental trees, and cause the better care and cultivation of not only their orchards and gardens, but of their farms—yea, and I might say of their families; for who will question the elevating and refining influence of the monthly meetings of a live, working horticultural society?

Through the influence of the Society our State Executive was induced to name a day to be called "Arbor day," and to be celebrated by planting trees and ornamentals.

Then was begun a systematic ornamentation of the school grounds of the State, beginning with the State institutions and finally going out to the grounds of the common schools.

At the various meetings nurserymen were called on for donations of trees, shrubs, plants, etc., and let me say, they have never in any instance failed to respond most nobly to the call; not only from Missouri, but from adjoining states came the response, I will send so and so, until all of the State institutions and most of the other school grounds have been to a greater or less extent beautified.

The work at the State institutions and private colleges has been done under the supervision of the Executive committee, with the able assistance of Professors Kern and Kesler, who have rendered valuable aid in the work by drawings and suggestions that only a good landscape gardener can give.

This work is not done, but will be followed up from year to year until every school ground in the State, from a State normal to a district school, shall have felt the touch of the work of the State Horticultural society.

The Society has taken advantage of every opportunity to show up the true merits and capabilities of the State by the exhibition of her products in various places in the United States, and the members are proud of the fact that in no instance, either for honor or for money premiums, has she had to take second place.

These exhibitions have attracted not only buyers for our products, but hundreds of families of good people have come to our State and bought lands and planted fruits and are some of our best citizens, and some of our best workers in the Society.

Thus have many millions been added to the taxable wealth of the State, many thousands to the population, and our State been brought up to the front rank as a fruit-growing section.

The very efficient Secretary has published annually a report of the doings of the Society, giving the minutes of meetings, discussions, papers, etc., making a volume of 300 to 500 pages that would do credit to a much older State.

These reports have been much sought after by people outside of the State, and have been the means of inducing many home-seekers to come and add to the population and wealth of the State.

This is some of the work that has been done in the past. Now what shall be said of the future? Shall we be able at the end of another seven years to say that we have accomplished much that is good for ourselves and the State?

It seems to me that the golden opportunity for Missouri is now dawning, and with the earnest and harmonious co-operation of the best workers, representing all the various interests, and the aid of the handsome appropriation made by our Legislature, Missouri can, and will at the coming World's Fair at Chicago in 1893, show to the world what she really is—one of the very best States in the Union.

I believe I am perfectly safe in saying that the horticulturists of the State will respond to the call by rolling up such a grand display of products as was never before made by a single State.

At the last annual meeting of the Society a resolution was adopted instructing the Executive committee to ask the Legislature to appropriate twenty-five thousand dollars for the use of the Society in making an exhibit at Chicago in 1893. The committee discharged their duty faithfully, but the Legislature saw fit (and perhaps wisely) to make one general appropriation, and I trust the commissioners in charge, in their wisdom, will see the importance of giving the Horticultural department a chance to show to the world the possibilities of the State.

Our home work should not be suffered to lag; more local societies should be organized, until at least one-half of the counties are put in good working order.

Every county in the State ought to be represented at Chicago by some of our varied interests in 1893.

I cannot close without expressing the thanks of the Executive Committee to all the members, and especially to those who have rendered such valuable aid in preparing for and managing the meetings and exhibitions, for without the assistance and co-operation of all the members little could be accomplished.

MISSOURI AS A FRUIT STATE.

N. F. Murray, of Oregon, Mo., then read a paper upon "The Fruit Industries of our State." Mr. Murray's paper is here given :

The fruit industries of our State—where shall I commence, and how shall I tell you in one short essay, as I should like, all about the fruit industries in our State, scattered abroad as it is among nearly three millions of intelligent and industrious people. Spread out over a territory larger than all New England, located in the heart of the Union of States and in the geographical center of the fruit-growing belt of the continent, with soil and climate so admirably adapted to fruit growing as to place it in third rank as a fruit-producing State, and destined it when fully developed to lead all other States, and stand unexcelled in the industry by any like area of country on the globe. To do this subject justice would require a volume. And we think that the time is not far distant when we should have just such a work, showing up in detail the fruit industries of our State. This might be done in connection with a work of instruction to beginners in horticulture, as suggested by our worthy Secretary in his last report, and made to serve a two-fold purpose—instruction to the beginner and information to fruit dealers and home-seekers. The fruit centers should be carefully written up, and a record given of the large commercial orchards and berry plantations. In this way we could at once meet and answer the many questions propounded to us so frequently through long letters that are being received continually from east, west, north and south by our Secretary and many others, the answering of which becomes a burden to the few engaged in the work.

When our Secretary last summer placed the value of the fruit crop for the year 1890 at \$10,000,000, many doubted the statement—thought it too high. This started people to thinking and investigating, and after the apple crop was shipped, one official on the Chicago & Alton railroad reported the amount carried over his own road, and the other trunk lines through the State reported to him by their managers at 5,000,000 barrels of apples, which at \$2 a barrel, will make our \$10,000,000. Then add to this, if you please, our evaporated fruits, the product of our vineyards, berry plantations and other fruits, and who will for a moment doubt that the fruit industries of our State, last year, brought into the pockets of the fruit-growers and farmers at least \$15,000,000. This is certainly a fair showing and very encouraging—especially so if we remember that the Missouri fruit crop never fails; that it is just as certain as corn, wheat, oats or any standard crop. Then, if we should take into the account, as we should, and properly appreciate the great economy, health, pleasure and refining influences upon our own people of having a constant supply of choice fruits, we find something of such intrinsic value as not to be computed by or exchanged for dollars.

But are we, as sensible and progressive horticulturists, to be content with what has already been achieved? Have the fruit industries of this great State (an empire in itself) reached the limit of their growth and usefulness, the zenith of their glory? Will fruit soon become so abundant that it can't be sold for cost of production? Is it time to call a halt in this great enterprise?

These and kindred questions are ever in the minds of the people, and to all, we answer in the negative. And why? Because our country is growing rapidly. Cities are springing up all over our country. New markets for our fruit are opening up all around us. Our export trade in fruit is on the increase, and the demand for good fruit is now increasing more rapidly than our fruit plantations. Then

listen: do you not hear in the distance the dim rumbling tread of the coming millions, who will not only penetrate and occupy every now accessible spot of our country, but who will drain our swamps, irrigate our arid plains, dig down our mountains, develop our mines, build up our waste places and give our country a vast and dense population? who, under our system of government and free institutions, will be the most intelligent, best paid, best fed and best clothed nation of people on earth? And they will continue to want their fruit and be able and willing to pay for it. In fact, we believe the fruit industries of our State at present to be in their infancy, just beginning to grow, and, like a beautiful and thrifty vine, just beginning to throw out its young and tender shoots in all directions; and let us be careful not to tread, bruise or dwarf a single branch, but carefully train, cultivate, nourish and support each, till this great vine of industry shall fill our whole State, so that everyone may sit beneath his own vine and fruit tree and enjoy the richest blessings that earth can give to her inhabitants.

Our whole State is good for fruit, but some sections excel others in the production of certain species. On the south slope of the Ozark range, we find a section unexcelled for the production of peaches, where the trees are healthy, free from peach yellows, and produce nine crops in ten years. How I wish I could picture this beautiful country and the magnificent orchards of the Olden Fruit company—one hundred thousand trees, mostly peach, in all their grandeur and beauty of perfection, bending beneath their load of luscious fruit—and then show it to the peach-growers of New York, Delaware, New Jersey and Michigan, and tell them we have hundreds of thousands of acres of these fine lands, that will not only grow peaches, but other fruits, grain and grass, in fact, almost everything that man could wish; that it can be bought at \$5 to \$10 an acre; that the country is healthy, the people are industrious, intelligent and peaceable. Could we but do this, we feel sure there would be a stampede from those States to this more favored region that would soon develop this branch and add millions to the wealth of our State. And if we could only lift the curtain and get the disheartened fruit-growers of the frost-stricken regions of our Eastern states to look over our State and behold our orchards, vineyards and fruit gardens as they now are—if we could only get them to realize and appreciate our cheap lands, our superior soil and climate, our central location, with a good market at home, and all around us, our great network of railroads, comprising eight thousand miles within our borders, and connecting us with the markets of the world—our magnificent schools, backed up by an inexhaustible school fund, our churches, cities, parks and public institutions—if they would only for a moment brush away the fog of superstition and prejudice, and look in upon our State as it is, they would behold the blending together of some of the best and most energetic people of nearly all States and nations, crystalizing into one harmonious mass, marching onward and upward to a higher plane of civilization.

Could such a picture be presented in its true light to the intelligent fruit-growers and home-seekers in less favored regions in our own country and Europe, then Missouri would never need another advertisement. We may at least do something in that direction in the near future, that will result in much good and give a new impetus to the fruit industries of our State. Yes, we may possibly astonish ourselves and the world, if we will only appreciate and improve our golden opportunities. Last year our fruit industries received a grand boom on account of the failure of fruit in several of the Eastern states, which resulted in the planting of millions of fruit-trees throughout the State, and, at the same time, opened up a new market for Missouri fruits, fully equal to the increased planting. Many predicted

this would not occur again in a life time. One year has not passed, and lo! behold the same thing is to be repeated. Destructive frosts have killed nearly all the fruit over a large extent of country in a number of our Eastern states, which has turned the eyes of fruit dealers toward Missouri with a longing, wistful expression in search of fruit. Let them come and let us bid them welcome and receive them as brothers engaged in a laudible enterprise. Let us cultivate and spray our orchards, that we may show them more and better fruit than last year. We should build apple sheds in our orchards and lay in a supply of barrels; we should prepare to pick, pack and handle our fruit better each year. A portion of our fine large apples should be wrapped in paper to meet the demands of the fancy retail trade. We know that some will cry out, this is too much work and will never pay. Hold, my friend, give this plan a fair trial, and then we will listen to your verdict. The growth of the fruit industries of Missouri and the rapidly increasing demand in the markets of the world for the very best, will compel us to take these advanced steps in our profession or be left in the rear to meditate over lost opportunities.

And last, but not least, we may do a grand good work to further promote the fruit industries of our State by making our plans and arrangements now for getting up the largest, best and most magnificent show of fruit for the Columbian Exposition at Chicago in 1893 that the world has ever beheld. Let it be done through the auspices of our State society, at the expense of the State, by counties, and leave the world to judge of its merits. Let us have our little manual of information for home-seekers, and information to beginners, showing up the fruit industries of the State in their true light for distribution. Let this be done by a united effort of our State and county societies, with a will and energy worthy of the great State, nation and age in which we live, and we need have no fear for the future growth and prosperity of the fruit industries of Missouri, or the verdict of the world on our fruit show at the great Columbian Exposition.

A recitation by Miss Martina Martin was next. Mark Twain's "Darkey and the Steamboat" was given in a charming manner. Miss Martin was heartily encored, and responded with a short selection.

THE FLORISTS AND THEIR GROWTH.

Hans Neilson, of St. Joseph, then read a paper upon "The Florists and Their Growth in Missouri." His paper was as follows:

MR. PRESIDENT AND LADIES AND GENTLEMEN—While it devolves upon me to present before this meeting the florists and their growth in the State of Missouri, I beg leave to state that I am largely indebted to the Interior Department at Washington for information given in this estimate, as an addition to what has come under my personal observation. I believe it to be as near correct as it is possible to get at facts of such a character, as most information has come direct from florists themselves.

	Florists.
Date of establishment, 1840	1
Date of establishment, 1850 to 1860	3
Date of establishment, 1860 to 1870	5
Date of establishment, 1870 to 1880	27
Date of establishment, 1880 to 1890	50
Date of establishment, 1890	3
Number giving date of establishment	89

	Florists.
Number giving no date of establishment.....	52
Total number established in 1890.....	141
Total number of establishments owned and managed by ladies.....	10
Largest number of square feet of glass.....	65,000
Smallest number of square feet of glass.....	500
Total square feet of glass.....	1,240,095
Area of land used by florists, acres.....	237
Value of tools and implements.....	\$23,152 21
Total value of establishments.....	\$1,078,882 65
Number of men employed.....	579
Wages paid men per day.....	\$1 50
Total wages paid men.....	\$259,076 00
Ladies employed.....	85
Wages paid ladies per day.....	\$1 25
Total wages paid ladies.....	\$21,750 00
Number of horses employed.....	191
Cost of fuel used.....	\$38,237 79
Wholesale catalogues issued.....	90,000
Retail catalogues issued.....	553,000
Paid for postage.....	\$17,613 72
Paid for advertising.....	\$67,792 80
Paid for freight.....	\$7,069 74
Paid for express.....	\$30,948 09
Estimated freight and express bills on outgoing shipments.....	\$28,552 50
Hardy plants propagated, 1890.....	1,452,300
Roses propagated, 1890.....	150,762
All other plants propagated, 1890.....	4,403,128
Total plant sales.....	\$374,123 48
Total cut-flower sales.....	\$196,867 48
Per cent of stock sold at wholesale.....	35
Per cent of stock sold at retail.....	65
Number of florists in the United States, 1890.....	4,659
Number of florists in Missouri, 1890.....	141

From these statements I have presented to you it will be seen that the interest and growth in the florist business does not date back any further than 1870, and the most progress was made from 1880 to 1890, and the cut-flower trade is taking the lead over plant sales. In regard to the plant trade, there is one thing in particular which hinders a very rapid increase in the sale of plants, and that is the lack of knowledge by the purchaser how to care for them after they are received. Millions of plants either die or become sickly each year, failing entirely to give the desired effect expected by the purchaser, and the main trouble lies in the watering of plants. It cannot be determined by the clock, or any time of the day or week, but the golden rule is to give your plants water whenever they require it, and then in sufficient quantity to soak the whole ball of earth in the pots, or if they are in the open ground, water enough to soak the ground fully as deep as the roots are at work. Then let them rest until such a time as another supply is needed, unless the dust becomes very thick on the leaves. In such a case, syringe or sprinkle them just enough to wash the leaves, always bearing in mind that mature plants do not require a watering every night.

Allow me to call your attention to plant culture in California, where in some parts no rain falls for about nine months in the year, and still all who visit that country agree in praising the beautiful flowers there. In many instances parties could hardly find words to express their high admiration formed of plant culture in California. But now bear in mind these plants are irrigated, and no oftener than it has required the sun and heat to absorb the moisture deposited in the ground.

In the State of Missouri, as well as some of the bordering States, we are every year affected by dry spells during the summer, and if some amateur has it in his power, let him for one season try a judicious and moderate irrigation, even if it be at the expense of the water companies, and I am satisfied it will demonstrate the fact that Missouri soil will stand at par with California, and produce as many and as fine blossoms, size of plant and age to be considered.

Now, Mr. President, allow me to ask your indulgence and follow my thoughts back to the year 1871, when my eyes for the first time beheld these rugged hills, which yet to-day surround this beautiful and prosperous city, overlooking the turbulent waters of the Missouri river, and fastening my eyes on the trails left by the caravans and trains which had crossed the then great American desert, with their thoughts fastened upon the precious gold deposited in the promised land of California, my thoughts naturally dwelt upon the fame which St. Joseph had achieved as an outfitting post for these overland trains, and I concluded to remain as a citizen of St. Joseph. At that time this city scarcely numbered 20,000 people, which were arrayed in battle against each other, whether to allow progress and prosperity to enter our domain; but thanks to the partisans of progress, we are a great city to-day.

At that time there were less than 2,000 square feet of glass devoted to floriculture in St. Joseph, and one of our pioneer florists had his little place on the top of one of the highest hills, and carried his floral treasures in baskets to the market in the city. At that time \$150 covered all the cut-flower business in St. Joseph for a whole year, and at the present time many a day the sales overreach the amount of \$350 for a single day's work.

The glass then was less than 2,000 square feet, and to-day the number of square feet will overreach 60,000. Taking these facts in consideration and by close inquiry it will be seen that the same progress has kept pace with time all over the State of Missouri, and in some instances has far surpassed this here noted increase.

Now I have only one more thought to present, which is: Flowers were created for the education, pleasure and happiness of men; they are like unto a mirror reflecting the purity, grandeur and love of the Creator unto mankind, and if you will notice the signs of time, the vast deserts of the world gradually disappear; men go forward, take possession and convert these barren lands into veritable flower gardens, and some of our richest and most beautiful floral treasures have their home in these barren lands. Take this as a criterion. The time may come when the whole world will be converted into endless flower gardens, and the florists of Missouri will seek to out-rival each other to send flowers to every land on the globe.

Master Charles Guthrie was next upon the program. He sang a solo in a beautiful soprano voice, and responded to an encore by singing "Swanee River" in a manner that completely captivated the audience.

Mrs. Helen Laughlin of College Springs, Iowa, read a lengthy and able paper on the subject, "Some Lessons to be Learned from the Home Life of the Farmer and Fruit-grower." As a literary production it was full of beautiful sayings, and showed much study and thought on the part of the author.

Mrs. Laughlin was followed by Captain F. M. Posegate, who made a few remarks.

An adjournment was then had until 9 o'clock this morning.

The various committees that were to have been appointed yesterday will be announced this morning, the President having been so busy yesterday that he could not find time to select them.

SOME LESSONS TO BE LEARNED FROM THE HOME LIFE OF THE FARMER AND FRUIT-GROWER.

BY MRS. HELEN LAUGHLIN, COLLEGE SPRINGS, IOWA.

The habits of thought and general character of the average farmer and fruit-grower differ so widely in quality and in motive, as well as in the actual results, and are withal so changeable, that an attempt to deduce a lesson from the home life of one family would be quite as futile as to try to count the rain-drops or to retain upon the retina the shifting shadows of a broad prairie.

Home life does not consist entirely of eating, drinking, working and sleeping. The farmer and fruit-grower must of necessity have their homes in the country, cultivate the soil and make their living from the results of such labor. There are so many difficulties in the way of success that a superficial observer might say that the principal lesson to be learned was one of very hard work and very small pay. Even admitting this to be true of those who cultivate the soil, it is also true of every other class of labor, whether manual or otherwise. The discovery has not yet been made of any plan whereby men and women may obtain an honest living without honest work; and in order to succeed in any calling, the skilled hand, the trained eye and the well-developed muscle must be directed by the educated and enlightened intellect. The man who still plows, plants and hoes as his grandfather did, and for the same reason, will never become a progressive agriculturist, and nothing less than an intellectual earthquake could possibly shake him out of the old ruts and convince him that he is one hundred years behind the times.

The contemplation of nature in her choicest and most generous moods leads the mind by natural transition from results to causes; from the known to the unknowable; from all the wealth of tree, and grass, of bird and blossom, of sunshine and cloudlet, of south wind and perfume of flowers, to the Creator whose wisdom has formed for the human race this wondrously beautiful dwelling place.

From this one point of view we see that farmers and fruit-growers more than any other class have around them humanizing and beneficent influences. Removed from the strife, the turmoil and the competition of trade, and from the noise and hurry of city life, they have abundant opportunity to live an ideal life, the beauty and grandeur of which will leave its impress upon all future generations. The one great hindrance to this is the fact that those who might be most benefited by it do not learn the lesson until too late, and of those who do recognize the truth, but few will avail themselves of the benefits to be derived from it.

Fully thirty-five years of my life have been passed in the country in the homes of farmers. Teaching country schools and "boarding around" gives one plenty of exercise, also a good opportunity to become quite familiar with the home life of farmers, and to learn many lessons, one of which is, that a farmer's or fruit-grower's kitchen is a prime place to go when hungry, but the cook is more often than otherwise overworked and must I record it? under-paid. A volume could be written on this subject alone, but I will forbear.

The dwellings which constitute the real home of the family are in about nine cases out of ten entirely inadequate to meet the real needs of the family. Two or three rooms at most, small in size, without decent ventilation, and absolutely without conveniences to facilitate the work of the mother of the family, she must constantly labor at a great disadvantage, that by a little intelligent changing might be entirely avoided. No wonder that she finds more time for work than she does for reading or recreation.

In such a dwelling-place we find but few newspapers and no books, save the old and well-worn school-books which dignify one end of the clock-shelf. A few sickly-looking plants in broken pitcher, old tin pan or leaky box adorn some out-of-the-way corner, for "John" does not approve of women wasting their time with house-plants; beside, they are in his way and obstruct the light when it is his pleasure to sit by the window. John's farm is free of encumbrance; he has a few hundreds in the bank and has just sold his apple crop for \$1,000, yet he feels himself greatly injured because his wife has failed to pick all the blackberries that grew in every fence corner and dry all the wind-falls that were wasted before he sold his crop. She might at least have given them to the pigs if she couldn't save the berries. His mother never failed to do such things, and never asked for help to do the work for a family of *seven*, of which John is the *seventh*, which accounts for his wonderful smartness. John is very economical; so is Mrs. John. She has to be, she told me, because he is trying to save enough to buy the forty-acre lot that joins us on the southwest. We began with only forty acres and were in debt for that, and John said when it was paid for he would fix the house; but he took a notion he must have a square mile of land just as his father did, and so the new house must wait for that. The end and aim of John's life has been to own more land, and his line of thought and motive for action has degenerated into a repetend, which reads as follows: "Work more hours to make more money to buy more land, so as to work more hours to make more money to buy more land." In pursuing this one object, those things that make home attractive, which cultivate the mind and heart and make life worth living, were neglected and forgotten. The needs of the soul were neglected to make room for grosser and less important objects, and their home was such only in name. Out-doors the never-ending round of plow, plant, gather, in-doors the daily routine of cook, eat, wash dishes, filled the wearying procession of days from year to year.

The most distressing feature of such a life is the monotonous, joyless, uninteresting flow of their declining years. They have missed so much of beauty, of sweetness, of grace, and of that greater gospel of love and faith that permeates a nature made nobler and purer by listening to "sermons in stones" and reading "books in running brooks," that now in their old age they are as much strangers to the world we live in as though stranded on a desert island. They hear the birds sing, but their melody does not strike a responsive chord in their own souls; they see the flowers and trees, the waving fields of grain, and the dim, cool recesses of the shadowy woods, but these beautiful sights do not appeal to their higher nature. In the birds they see only the destroyers of next summer's crop of cherries, and the grain represents just the number of round, shining dollars they will receive for it; while the grand old trees that shed a benediction on all who pause beneath their shade mean to John only so much chopping and back-ache as is necessary to prepare them for fire-wood. Is it any wonder that the home life of John and his wife was not productive of blessing to the children reared therein, or that the lives of the children also are permeated with the same sordid, grasping spirit? Until such home life ceases to be, there will still be found those whose acres are only limited by the ability to acquire them.

No man has a right to deprive even himself of a chance to develop the best there is in him for any reason, for by so doing he cheats himself and robs his family. Some one has said that every child has a right to be well born, and to this I would add the unquestionable right to be well brought up; to have his mind trained to grasp the true import of those great questions that are agitating the leading minds

of our times; to have his conscience taught to discriminate between right and wrong; to have his whole mental and moral nature, as well as physical, properly adjusted and evenly balanced.

Nowhere in the world is such training as easily attainable as in the homes of the intelligent and progressive farmer and fruit-grower. All those influences which tend toward a proper expansion of the youthful mind, and which not only develop the physical nature but lead the moral faculties upward toward a nobler and purer life, surround the country home in great profusion. Here more than anywhere else it is possible to render our home life as truly Arcadian as the most earnest enthusiast could desire. The house may be small, but within it you will find comfort and beauty. Books and newspapers, the latest magazines, music and painting, make glad the hearts of those who dwell therein. The latest achievements in art, science and literature, the latest discoveries of the microscope, and the last new invention in electrical machinery, are brought to this home by the weekly mail and discussed and thoroughly understood by the family. They are well read on all those topics that affect the stability and prosperity of the nation, and are in sympathy with all those united efforts that are being made by Christians and philanthropists to blot out crime and ignorance. Such homes are shrines wherein dwell all the virtues; fit dwelling-places for those who are the main hope and dependence of this mighty nation; and such may be if we will it, the home life of all earnest, progressive farmers and fruit-growers.

A house is not well kept unless it is truly home-like. Some houses are at sixes-and-sevens from one week's end to another, and it requires a skillful pedestrian to be able to navigate from one room to another without danger to life or limb. Others are kept too much, and are so painfully neat as to repel all familiarity. They seem to say to you: "Do not touch me, you will leave a finger mark!" "Do not step on my newly-scrubbed floor, you will leave the tracks of your dreadful boots!" "Do not leave the door open, a fly has just gone upstairs!" etc. The children from such homes as these are glad to get away and out into the world as early in life as possible, and it needs no prophet to predict what their future will not be. I remember hearing of a little girl who, on being asked her name, replied, "Katy Don't." She had never heard her own last name spoken, and as she was always getting into something that her mother denominated mischief, was so accustomed to hear the admonition, "Katy, don't," that she supposed it was her real name. It is from such homes as these that the "Katy Don'ts" may be expected to emanate. The mother is possessed by the demon of neatness, to which everything else must succumb.

She brews and bakes and groans and sighs,
From morning light till sundown gun;
She scrubs and stews till nine p. m.,
Then sews and darns till half-past one.

She never rests, this tireless dame;
Her house must keep from dust and din;
To read a magazine or book
Would seem to her a grievous sin.

If on the floor, or chair, or wall,
A speck of fly, or scratch, or stain,
Could e'er be found with microscope,
She ne'er would sleep in peace again.

Such a house-keeper is unconsciously making of herself a mere machine for the suppression of dust and disorder; a slave to the mop, broom and dust-pan. Fortunately such extreme cases are rare, and we know that the majority of farmers'

and horticulturists' homes give every evidence of thorough refinement and of broad culture. Life may not be quite so highly seasoned, but it is certainly much sweeter and more satisfying.

If during the pressure of work we pause between whiles to ask ourselves what we have already accomplished, and to formulate some definite plans for the future, we may well say, "what are we living for?" Is there in our plans for future work some supreme object which shall be for our best good and for the benefit of those around us, or are we merely straggling along the pathway of life for temporary existence, caring nothing for the effect of our work upon the world, and still less, it would seem, for its effect on our own souls, our individual character? What is the object of life? My answer would be to be good, to do good, to be happy and to make others happy. This will include all the attributes of a Christian character. The old-fashioned notion, almost as old as the earth itself, that it is very wicked indeed to be happy—that a hearty laugh is a sin, and that future bliss is only obtained by present misery—is rapidly giving way before a more enlightened religious sentiment and a more exalted conception of the power, attributes and designs of the Deity. It is not against the law nowadays for a man to kiss his wife or his baby on Sunday, although a man was arrested a few days ago for kissing his wife on the street after dark, and was too badly scared to explain their relationship until they arrived at the police court. This, however, occurred in Boston. We of the great West are not so crowded either in mind, manners or morals. Nearly everyone now admits the right of the individual to be happy. Our Constitution says the "pursuit of happiness," and I see no reason to doubt that if all the members of a family unite in pursuing that elusive attribute of a happy home, it will be caught and caged without much difficulty. This can be done in any home, whether city or country. Ye who doubt, try it. "The proof of the excellence of the pudding is in the eating."

Those who live in cities, and especially the laboring class, have their days so constantly filled with that arduous toil necessary to provide for their daily needs, that there is little time left in which to cultivate the mind, heart and soul. Their home life is made up of a continuous round of work, eat, sleep, with little hope of a change for the better. When the hurry and worry of getting a living is so great that a man fails to recognize his own daughter across the street, it is time farmers and horticulturists rejoiced that their home life is such that a man will find time occasionally to get acquainted with his wife, and be able to distinguish his own boys and girls from the rest of a crowd of youngsters in his own door-yard.

My earliest recollection of fruit was connected with the romantic scenery in Central New York, known as the lake country, now made famous by the vineyards belonging to the Hammondsport and the Keuka Wine Co. My father's farm abounded in fruit of all kinds; the choicest grapes, the sweetest cherries, peaches every second year, pears that melted in your mouth, and apples that, for size, beauty and flavor, I have never seen equaled. But the very sweetest, the most fragrant and the most delicious of all were the wild raspberries that grew above the orchard in the old fence row, which I gathered, though in trembling dread of snakes, and, stringing them on a green timothy straw, carried them proudly to my mother. In looking backward toward childhood, we always wear rose-colored magnifying glasses.

If one wishes to thoroughly enjoy and appreciate the delicious flavor of really good fruit, let him live a few years in a city and buy his fruit from the market.

Fruit-stands make a tempting display from early spring until late autumn, but only disappointment awaits unwary purchasers. Berries, which you are assured

are "picked this morning," you will find have been *picked over* this morning and a few good ones placed on top; peaches wilted; plums leathery; apples that would astonish a green persimmon; tomatoes, peas and other vegetables gathered last week. The prices might be regarded with *awe* at least, if not with satisfaction; and until I learned better, my opinion of farmers and fruit-growers was very low indeed—growing wealthy and impudent off the necessities of poor dealers who couldn't help themselves.

A little careful observation and some inquiry, combined with a modicum of common sense, convinced me that these aristocrats of the farm, garden and orchard, who raise the meat and beans and potatoes with the other vegetables that keep soul and body together, are really the servants of the world. Without them other people would be deprived of all the comforts and many of the luxuries of life, and as a matter of course, they have things pretty much their own way regarding the price of their commodities. But do they set their own prices? Oh, no. Then of course it is the consumer who decides what a barrel of apples, a bushel of potatoes or a couple of bunches of asparagus are worth.

But no, the decision does not rest with the consumer. It would seem reasonable that the producer and consumer, as the parties most deeply interested, and abundantly capable of judging, would be the best fitted to set prices. Instead, it is the dealer, who says to the producer, "this much I will pay and no more. Accept my price or keep your produce." I am not undertaking to propose a cure for this palpable evil, and will only suggest that from these hasty thoughts the producer deduce his own lessons and formulate a remedy for himself. Surely the balance of power could be in your own hands by more united effort, and a larger measure of financial success would place in your hands other opportunities for benefiting the world.

Notwithstanding all the difficulties in the way of the farmer and fruit-grower, there are many of them who really do attain to independence, beautify their homes, and educate their children for a more extended sphere of usefulness, and the home life that is possible and real for the rural dweller is but barely attainable in the suburban home, and impossible in the heart of the hot, crowded city. Even in our smaller towns, among the laboring classes we find often two and quite frequently three or four families huddled together in one house, or in hot unhealthy rooms over some store or office—the majority of them thankful for even this shelter, provided the rent is not beyond their slender means. Fresh air, pure water and suitable exercise are free to everybody outside of a city corporation; but what opportunity for either is afforded the occupant of a city boarding-house or the poorer, over-crowded and ill-ventilated tenement? Verily neither air, water nor exercise is free amid such unnatural surroundings, and it is not surprising that children are dwarfed in body and enfeebled in intellect, or that vice and crime stalk abroad at noon-day as the result of such unfavorable influences. What wonder that the asylum, the work-house and the penitentiary are recruited from these miserable apologies for homes. How can the soul grow and the mind broaden and expand to sweet Christian influences, when the body is starved for want of suitable food and the lungs shrunken for want of oxygen?

The grand possibilities which are the heritage of the children of our magnificent rolling prairies or the romantic timbered regions, are like voices from an unknown world to those who have never seen and enjoyed their freedom. It takes a whole lifetime to learn how to live; and in towns, one must practice the strictest economy for the most of a lifetime before one can afford to live in ordinary comfort. But the farmer and horticulturist can live and enjoy the good things of this life as

he goes along, and can at the same time be adding daily and yearly to the value of his home. Could each of us for one year be obliged to exchange our country homes for city staying places, we would be the better able to learn the useful lesson of contentment. More than this, we would see the possibilities for the idealizing of our own home life, which are not to be found under other circumstances and in other avocations.

We, as a people, are the architects not only of our own fortunes, but of our own homes and home life. In painting and sculpture, the student acquires his theory as well as his practice by daily experiments: that is, by actual doing; and the same is true of our home life, but our materials are different. The student of painting is limited to a few colors, a handful of brushes and a piece of cold, unresponsive canvas; the sculptor to a chisel and the block of hard, unyielding marble. The architect of country home life has none of these limitations to contend with. We are furnished, without cost or stint, with the same material used by nature; our chemicals are from the same laboratory, and with this inexhaustible treasure at our command, we may fashion what we will, and give it the impress of our own individuality.

It is well known that the majority of men and women of this or earlier periods who have attained to eminence or distinction, have sprung from humble parentage and have been reared in the country. Many of them received their first instruction in the old log school-house with puncheon floors, and pursued their later studies by the light of a pine knot or by the open fire-place. They rose superior to circumstances, and bequeathed to us an example of heroic determination and honorable ambition, which the youth of our times would do well to imitate.

In a copy of an old Kansas State Horticultural report I found the following unique statement, which I quote to show what queer notions some men have regarding their individual responsibilities as citizens:

The writer says: "Farm embellishments have their difficulties and drawbacks in many ways. We meet with hot suns and cold winters; there are storms and drouths, blights and mildews; these are unavoidable, and with proper planning, care, attention and culture, may be mitigated and mostly overcome. Another enemy is the State. In most states men are fined by law for improving and embellishing their homes. A farm of 160 acres occupied by a tenant cabin, a straw stable, a pig-sty and a cow corral in front, is taxed somewhat above the rate of raw prairie, yet the price of the rude and simple crops may in some measure justify increased taxation. Let the same farm of 160 acres contain a \$2,000 dwelling and other buildings and improvements, with orchards, groves, wind-breaks and other tasteful embellishments, and the taxes are doubled, trebled or even quadrupled. This is fining a man for improving and beautifying his home."

The writer also advanced the idea that taxes should be on land values only, and then it would not be so common for men to hold lands in speculation, or for slipshod farmers to occupy large tracts of country with poor improvements and low taxes, while the highly improved, neatly kept and embellished homes are taxed to discouragement and bankruptcy because of their neatness and comfort.

According to this method of reasoning, a man might own an acre of land worth \$5 and build on it a \$20,000 mansion. His neighbor who joins him could own 500 acres, worth also \$5 per acre, and with no house at all. The acre with the \$20,000 house is worth in actual value four times as much as the 500 acres, yet the man who owns the large farm with nothing on it must be taxed 500 times as much as his neighbor.

To quote again: "Savagery and barbarism should not be favored with lighter taxes while cultivation, comfort and beauty are loaded with pains and penalties. Surely the austerities of nature and the depredations of birds, beasts and insects are drawbacks enough, without adding to them the burden of increased taxation."

If this plaintive wall is true, it would seem that the remedy is entirely within the power of the oppressed. True or not, it is a fact that those who cultivate the soil have for centuries been attending strictly to their own business, and have left the law-making power to not always disinterested parties who have not been forgetful to "make hay while the sun shines," and have manipulated the laws to suit their own peculiar views.

The old adage, "If you want anything done, go do it yourself; if you don't want it done, send a hand," is as true as regards legislation as of anything else, and if agriculturists want just and equitable laws made, the way to have it done is to go and help make them.

The home life of the farmer and fruit-grower is such as to produce the grandest and most brilliant minds of the age. There is where we will find our true noblemen and women. Lawyers, great capitalists, railroad kings, ward politicians and unprincipled demagogues of whatever name or degree have nearly had their day, and the time need not be far distant when even the highest office in the gift of the nation may be filled by one of nature's own noblemen, born and nurtured among the refining and beneficent influences which abound in the home life of the farmer and the fruit-grower.

WEDNESDAY, JUNE 3—9 A. M.

The second day's session of the Missouri State Horticultural society opened with a largely increased attendance and a much larger display of the most delicious of all the fruits of the earth, strawberries, in every variety considered worth growing by the horticulturist. And there are a large number of varieties, including very many sizes and shapes. Some are as small as cherries and some are large enough to be mistaken for red tomatoes; some are as pale as a May cherry, and they are of every tint between that and the dark red cherries of midsummer.

There are no strawberries on exhibition from Northern Missouri, as the season is too early yet, and all the berries on exhibition are from south of this latitude. Strawberries in Atchison and Nodaway counties will not be ripe for a week yet, though there some fine are exhibitions from Buchanan and Clinton counties, and Doniphan county, Kansas.

The exhibition of cut-flowers is very fine, and besides including many rare and fragrant blooms, they are beautifully and artistically arranged.

The morning and afternoon sessions were occupied with the discussion of "Strawberry-growing: instructions for beginners, location, exposure, soil, preparation, planting, varieties," and "spraying, gathering, marketing," etc.

Samuel Miller, Bluffton; J. N. Menefee, Oregon; L. A. Goodman, N. F. Murray, J. C. Evans, D. A. Robinett, J. B. Durand and others gave much valuable information in the discussions of these topics.

The various committees were named as follows:

Finance—S. W. Gilbert, C. C. Bell, N. F. Murray.

Fruit's—F. Holsinger, T. M. Russell, S. H. Logan.

Flowers—Samuel Miller, Mrs. G. E. Dugan, Mrs. W. R. Laughlin.

Obituary—G. W. Hopkins, J. H. Logan, C. W. Murtfeldt.

Final Resolutions—W. R. Laughlin, R. Lynn, G. E. Williams.

The following are among those who were in attendance:

L. A. Goodman and wife, Westport; N. F. Murray and wife and Miss Murray, Oregon; J. C. Evans and wife and Miss Joy and John Evans, Harlem; Samuel Miller, Bluffton, Mo; S. W. Gilbert, Thayer, Neb; C. C. Bell, wife and daughter, Boonville; W. R. Laughlin and wife, College Springs, Ia.; William P. Parmeter, Hamilton; G. H. Segessman, Amazonia; S. G. Laughlin, Mrs. S. G. Laughlin, College Springs, Ia.; J. M. Russell, Wymore, Neb.; J. Zimmerman and wife, Amazonia; A. C. White and R. Lynn, Tarkio; T. F. Miller, Avenue City; Joseph H. Murray and Edna J. Murray, Oregon; C. Shultz, Craig; J. T. Oder, Bolton; C. W. Murtfeldt, Kirkwood; C. M. Mosher, W. A. Long and H. M. Hasness, Mound City; Arnold Segessman, Amazonia; G. E. Williams, Chillicothe; D. A. Robinet, Columbia; F. Holsinger, Rosedale, Kas.; S. Love, Chillicothe; J. B. Durand, Prairie City; A. J. Blake, St. Louis; W. W. Knoop, John Zimmerman, John Trice, Cameron; F. J. Nance, Lawson; S. P. Turner, Meadville; A. E. Bradley, Lake Station; J. Shellenberger, Nodaway; C. Thorp, Westport; William Ent, Savannah.

HUGO, Mo., June 3, 1891.

L. A. GOODMAN, St. Joseph, Mo.:

SIR—I intended to send you some strawberries, but a severe rainstorm yesterday blasted all my hopes of finding any fruit fit for exhibition. I have tried at odd moments to write a paper for the meeting, seeing that I am billed for one, but could not keep my thoughts together long enough to produce anything fit to read; in fact, am so worn out with labor—taking care and disposing of my berries—that I had to postpone a great deal of work and to confine my correspondence to business matters only.

Will give you a few short notes on the behavior of some of our berries, and at some future time will send a paper for publication.

Michel's Early—Fine, profitable; too soft for shipping to distant market; some blight.

Schnell's No. 9—Very nice, but not quite as early as Michel's Early.

Cumberland—As fine as ever, though not altogether free of faults.

Crescent—Still the standard; ranks among the best.

Captain Jack—Good for shipping; needs good culture to obtain berries of standard size; very firm.

Hart's Minnesota and Warfield No. 2—Tolerable; will try to get along without them in the future.

Jessie—Discarded.

Piper—Excellent quality; productive, but dark and soft.

Sharpless—Not up to the mark.

Bubach No. 5—Fine, large, fancy fruit; plants large and stocky; will plant it more extensively.

Haverland—Have but a few plants ; they bore abundantly ; fruit fine and nice.

Windsor Chief—An excellent sort.

Gandy and Cornelia have not got around yet ; Gandy very promising, but does not seem to be very productive.

Yours respectfully,

F. LIONBERGER.

The first real work of the second session was a report on the Strawberry by Judge Samuel Miller. Many of the delegates have known Judge Miller through his contributions to the "Rural World." To the strawberry grower, he is known as the originator of Captain Jack. The first statement in his report was that old plants on good beds, not too thick, will ripen fully a week earlier than on young vines. Regards Bubach No. 5 nearly faultless. Crescent as good as ever. Capt. Jack the same. Thinks Ella and Michel's Early the same. Gen. Putnam leads all the new varieties. The Jessie better than ever and Ladies' Pine choicest in quality. Judge Miller exhibited twenty-seven varieties, and was awarded the premium for best collection.

STRAWBERRIES AT BLUFFTON, MO.

SAMUEL MILLER.

Atlantic—Late ; not yet fruited.

Alabama has some promise.

Auburn—Not fruited yet.

Albany—No use here.

Bessie—A first-rate berry of medium size.

Bubach No. 5—This is perhaps the most valuable market berry we have, that has been fully tried.

Bellmont—Large and fine, but not productive enough.

Brilliant—Just what the name means.

Beder Wood—Promises well.

Crescent—The same productive berry as always, but I think can be spared now.

Captain Jack, always loyal.

Colossal, a large, fine one.

Cumberland, well known.

Cloud, a very good one.

Comet, not needed here.

Dew-drop, a large, early, fine berry ; good quality.

Ella—Much resembling Michel's early, and may be the same.

Eureka—A splendid berry in all respects, but doesn't stand our hot sun well.

Enhance—Large, productive, handsome, of only ordinary quality.

Farnham—Promises well ; good quality.

Gen. Putnam—One of the largest and handsomest of strawberries ; very productive and of good quality. This one will make its mark.

Glendale—A valuable one.

Gandy—Still the most valuable late one, but not as productive as it might be.

Gelishe—Very handsome and good.

Gem—A noble one.

Hart's Minnesota—A large and productive berry, and one that is well worth keeping.

Hoffman—Valuable in my grounds.

Hovey—Fine, but is behind the age now.

Heath—A most promising new one ; fine in every respect.

Huntsman—A very promising one.

Haverland—A general favorite, but too soft with me.

Jessie—Finer this season than ever before.

Jefferson—Not yet fruited.

Longfellow—A valuable one.

Ladies' Pine—Below medium in size, pink in color ; not firm enough nor productive enough for market, but decidedly the best in flavor of all the strawberries yet produced.

Mt. Vernon—A good late one.

Miller Amos' No. 5—Next to Ladies' Pine in quality, larger, firmer and more productive.

Mrs. Cleveland has come to stay.

Michel's Early—This is just eight days earlier than Crescent, about the same size, firmer, much better in quality, and lasts one month ; not quite as productive as Crescent, but will take the place of that variety.

Mary Stuart—One of the best late ones, very handsome.

Miller, from Louisiana ; a very fair one.

Ohio Centennial—Large and fine, but don't produce plants enough to become popular.

Oregon Everbearing—This did not carry out its name last year, but promises to do so this, as there are more blossoms on it, while the first crop is gone. It is well worth growing, even if it would bear but one crop ; very firm, handsome and good.

Payne—This, in my opinion, will have a name in the land ; large, handsome, firm, very productive and of good quality, from medium season to late ; at this date the fruit lies in piles, while the main crop of this fruit is nearly over.

Prolific—A wonderful berry, and will be heard from.

Pet—An accidental seedling here ; large, early, productive and high in the scale of quality.

Perfection—Not that with me.

Parry has had its day, I think.

Parker Earle—Very promising.

Riehl No. 1 and No. 2, of the Captain Jack order, both promise to get a place on the list.

Regina, from the Gulf of Mexico, promises to be very valuable. Large, immensely productive, handsome, good quality, and among the very latest.

Sadie, a perfect daisy ; productive almost to a fault, medium in size, very handsome and excellent in quality.

Smith's No. 77 is a promising one.

Sucker State, good, but has been superseded by others by the same originator.

Stayman's No. 1, a berry that will yet be popular.

Stephens—Not much with me.

Townsend's No. 3 and No. 7 are both valuable—the latter the parent of thirteen seedlings of my own, many of which promise well.

Thompson's, of which I have fourteen numbers, have among them some of the most promising I ever saw. Conspicuous in the list are Nos. 4, 7 and 51, the latter

and No. 7 among the finest berries on my place this season. They are destined to make a noise in this line.

Vick, a berry worth raising if properly treated.

Warfield No. 2—In my opinion, one of the most valuable of the proved ones. It has come to stay.

Van Deman—This gave great promise last season, but this year it overdid itself in blooming; produces fine large berries.

I will not go into detail in regard to the treatment of the different varieties, but find that they need different training.

What we want is a berry in all respects like Bubach No. 5, with firmness of Captain Jack and quality of Ladies' Pine; then our name will be "Eli." I have now seedlings coming up of Ladies' Pine crossed with Jessie and Cumberland, and may at least gain in size. Out of Thompson's and J. B. Miller's I expect a list that will nearly fill the bill. The excessive rains have spoiled the flavor of many of our late ones, and don't give a fair chance to test their quality.

S. MILLER.

P. S.—Be it remembered that most of those mentioned are under restrictions, and I have no plants for sale. Payne and Ladies' Pine are, however, mine to dispose of if wanted.

S. M.

In the discussion it was shown by those who had fruited Michel's Early that it is taking a place in the front rank.

A wide difference of opinion as to many varieties was shown, owing to difference in soil and methods of cultivation.

For market purposes the choice of a large number clustered closely around Warfield, Bubach, Michel's Early and Crescent.

Prof. Clark would grow firm, hardy varieties for market, and for home use, fine flavor, without regard to shipping qualities.

Judge Miller reported of our own seedlings, out of thirteen kinds only three are poor.

Vice-President Murray would plant Michel's Early in place of Crescent. Maj. Holsinger would go slow on new varieties; prefers the Jessie to the Cloud. His experience with the Michel's Early has not been favorable. Regards the Crescent very highly, as it has made him more money than all other varieties. Believes every grower must determine for himself the varieties best suited to his soil, climate and market.

Mr. Gilbert, of Thayer, has not grown the Michel's, but a neighbor who had it did not succeed as well as with the Crescent in the same soil. Would not advise planting Michel's too largely.

N. F. Murray would not compare results on neighboring plantations unless he knew all the conditions and environments. His experience with new varieties led him to believe that they are so much purer than later on, that they always do better than later on when they have "run down" in purity.

Mr. Gilbert—Crescent has not rusted for him, but did for a neighbor on different soil.

What shall we do when plants rust?

Judge Miller—Dig them out and burn them up. If they suddenly fail for other reasons, dig down and you will find a worm near the roots that has done the business.

What will prevent them? He said, plow the ground in the fall and replot in the spring.

Mr. Mosher has the best luck with the Jessie, and recommends Jessie and Bubach for market.

What shall a beginner plant?

Maj. Evans—Let him take six or seven of the best varieties and test them, discarding such as do not succeed. No rule can be laid down that will bring same results in different hands. Has had best luck with the Jessie, but does not recommend every one to plant it, however.

Mr. Turner has several varieties, but his best success has been with Bubach, fertilized with the Jessie. Soil, sandy loam; but on clay soil they make strong plants.

Prof. Clark has a large number of varieties at the Experimental farm. The Crescent has succeeded well. The Jessie best when best fed. Warfield's No. 2 does well. Thinks Michel's Early will ripen the entire crop earlier than other varieties. Van Deman is fine looking.

SOILS.

Rev. Murtfeldt had grown best berries on subsoil taken from the cellar.

Judge Miller believes some of the clay subsoils are good for berries.

Maj. Evans thought that the subsoils, when thrown up to the surface were the best place for berries.

Mr. Murray, of St. Joe, had noticed best growth of plants from clay subsoils.

J. H. Logan, of Nevada, had best berries from clay lands; they were eight days earlier.

EXPOSURE.

Prof. Clark recommended southeastern and southern exposure for earlier berries, while Judge Miller had found a due east exposure the earliest.

PREPARATION OF SOIL AND PLANTING.

Prof. Clark—Manure well and subsoil. Plow in fall, if possible; top dress with manure and finish by sowing ashes, fifty bushels to the acre. Feed the plants well. No value in coal ashes.

Mr. Logan—Mark with a corn planter—plants from eighteen to twenty inches in a row; can plant very fast with a spade.

Judge Miller sends boy to distribute plants and he follows with a trowel.

The following lists of strawberries were given :

J. W. Arthur, St. Joseph—Names for market, Michel's Early, Bubach, Crescent; for home use, same.

S. H. Murray, St. Joseph—Names for market, Warfield, Bubach, Sucker State; for home use, Miner's Prolific, Mt. Vernon, Crescent.

D. A. Turner, St. Joseph—Names for market, Warfield, Bubach, Jessie; for home use, Crescent, Cumberland, Bubach.

Ralph Smith, Laclede—Names for market, Crescent, Warfield, Michel; for home use, Bubach, Jessie, Pearl.

J. C. Evans, Harlem—Names for market, Michel, Warfield, Jessie; for home use, Michel, Cumberland, Jessie.

N. F. Murray, Oregon—Names Michel, Warfield, Bubach.

F. Holsinger, Rosedale, Kas.—Names Jessie, Haverland, Crescent.

Sam Miller, Bluffton—Names for market, Michel, Warfield, Capt. Jack; for home use, Michel, Warfield, Gandy.

J. H. Logan, Nevada—Names Michel's Early for best early berry; Miner's Prolific for most profitable berry; good size, carries well and a good yielder. Glendale, our best late berry; never have found as good a shipper; carries from our locality in good condition to Denver. Locality, Vernon county; upland timber, sandy, gravelly soil; one week earlier in ripening fruit than the prairie soil.

Henry D. Korf, St. Joseph—Names for market, Crescent, Jessie, Bubach; for home use, Bubach, Jessie, Haverland.

J. B. Christy, Browning—Names Crescent, Bubach, Jessie.

G. P. Turner, Meadville—Names Crescent, Warfield, Bubach.

S. W. Gilbert, Thayer—Names for market, Glendale, Capt. Jack, Crescent; for home use, Michel, Gandy, Cumberland.

J. W. Clark, Columbia—For market, Michel, Haverland, Crescent; for home use, Michel, Haverland, Bubach.

W. W. Knoop, Cameron—Names for market, Crescent, Bubach, Haverland; for home use, Bubach, Jessie, Haverland.

L. A. Goodman, Westport—Names Warfield, Jessie, Bubach.

MARKETING.

A man ready to engage in fruit-growing should well study the markets he intends to supply. He should do so even before he orders his plants or trees, as the case might be. If, for instance, he intends to supply neighboring towns with small fruit, he should first select the very earliest sorts, providing they are good. For

this purpose, among strawberries I would consider Michel's Early as the best. The fruit is large and nice, but a little soft, though for local market this does not matter much. It is a very fine grower, though somewhat subject to leaf-blight. Besides this, Cumberland, Bubach No. 5, Haverland and Gandy would make, I think, a very fine list. If, however, it is intended to ship to more distant markets, Captain Jack undoubtedly is one of the most reliable sorts. It is, I think, very important to secure as much trade in local towns before shipping further. The best way, in my opinion, to do that is to go and visit the towns you intend to supply a few weeks before your fruit will be ripe: that is, unless you have already established your trade. To simply ship to some one, who you have heard handles fruit, will not do. I have tried that. Last spring, while on a business trip, I was surprised more than once to see the establishments that had handled fruit for me before, perhaps, located in some out-of-the-way place of the town with a few goods scattered around the shelves. I do not wish to say anything to reflect on proprietors of such establishments, but if ever so honest, they are not the ones to handle your fruit to the best advantage. Select a merchant of the best standing, whose place of business is inviting and well located, such as is likely to be visited by the better class of people. As a rule, it is best to supply only one merchant in each town; but try to get the best; then go on to the next town, and so on until you think you have a place for all your fruit. However, be careful not to make too many promises. Do not make arrangements with more merchants than you can supply, for it is better to supply one or two reliable merchants right than to half fill the orders for half a dozen. After having these arrangements made, go home and secure your pickers, get your box material ready, etc.

Much might be said here about picking and packing; but I am afraid of making my paper too long, and so will leave this part for some one else to explain. As soon as your fruit gets ripe, commence to ship to one of the merchants you have made arrangement with; he will give you standing orders, if any kind of a merchant at all, but do not commence with any other until you can promptly fill his orders. As your fruit ripens up commence with another, etc. Above all things, be prompt; do your business in a business like style. Send an invoice with every lot, either in a crate or by mail. You must try to create confidence between the man you are dealing with and yourselves. Otherwise, if he has no confidence in you, if he is never certain whether his orders will be filled in full or only in part, or perhaps not at all, you are apt to miss the best orders for private entertainments, festivals, etc. Another thing: it is well to insure your fruit; you cannot afford to have your reputation injured on account of a few boxes of berries that should happen to be below the standard, for such a thing can happen with the best of care. I put a card into the bottom of every package of fruit that leaves my place, requesting consumers to report should there be anything wrong. In case you should have more fruit than you have local orders for, ship to some reliable commission merchant. Here, too, after you find a good house, patronize it; don't jump from one house to another; if you do, neither one will care about you; they will soon learn that your trade is too uncertain to look after. Of course, where large quantities are to be shipped, the case would somewhat differ.

One more point and I will be done. Have a good spring wagon to haul your fruit in. Give yourself plenty of time to make the trains you intend to ship on. Mark all your packages at home as far as you can, with stencil, if possible. Mark them at both ends, but not on top, unless the latter is needed to show which side is to be up. If you are always in plenty of time to meet the trains with packages properly marked, you will soon get the good will of the express agent, and if so,

he is in a position to often give you some advice, and even help. However, if you are always late, coming in, in a run, when the train is nearly due, your packages not yet marked, the case will be quite different.

Most respectfully,

F. LIONBERGER,
Hugo, Mo.

SPRAYING, GATHERING AND SHIPPING.

Mr. Gilbert had no occasion to spray. In gathering, he numbers the rows from one to a hundred, and assigns his pickers to certain numbered rows, and by this plan the superintendent can trace every row to the picker, and any damage or poor work is easily located. No talking or eating allowed during work. Pays 1½ cent per quart.

J. H. Logan pays 1½ cent per quart.

Maj. Holsinger put this very pertinent inquiry: What shall we do with the plants bearing fruit this year?

Mr. Logan plowed all under except a narrow row that is used.

Prof. Clark mows all off and throws a furrow away from each side of the row, leaving a space about eight inches wide; this he cuts out with a hand hoe. This should be done early, and it will fill in and do well. Believes the plants make a new crown each year, and may be fed to produce a long time.

Secretary Goodman would call attention to the importance to be gained by the care and feed given to the plants. Believes the plants do not "run out" as much as care and feed run out. Prof. Clark confirmed this statement.

Maj. Holsinger thinks the plants should be renewed at least every three years, as the soil has by that time been partially or wholly exhausted, and the crown borer is best fought by renewing the beds.

PROTECTION.

Mr. Gilbert: If price is meant, he would grow less acres, and take better care.

Judge Miller would use straw covering.

Mr. Logan uses for winter hay and coarse barn-yard manure, with leaves and straw for summer. Believes the very best covering is coarse prairie hay. Would not cultivate in spring.

DISCUSSION.

STONE FRUITS.

The Peach.—Mr. Gilbert had a little experience in spraying the peach. Got his spraying machine a little late. Used one pound to 480 gallons of water. Got a little careless on the second day and used the liquid too freely. Showed a sample branch badly burned by his over-zeal. Believes spraying all right if done right.

Prof. Clark spoke on the different nozzle sprayers, condemning some and recommending some.

Mr. Logan used one pound of London purple to 180 gallons, and found it too strong.

Mr. Murtfeldt thought there was no curculio and no need of spraying.

Mr. Lockhart was in favor of spraying for the codling moth, without waiting to see if they were to be plenty or not.

Maj. Holsinger had never seen in seventeen years so small a crop of curculio and codling moth as the present year.

Ralph Smith would like to have the experience of all who have used spraying machines. Is not satisfied, but believes that we should continue our investigation until we arrive at definite conclusions.

N. F. Murray thought if ground is kept clean but little damage would be seen from insects. The proper strength of the mixture to be used was an unsolved problem.

A. J. Blake, of the "Rural World," thought the experiment stations should take this matter in hand, and definitely ascertain the amount of both London purple and Paris green to be used to the hundred gallons, and the variation for different kinds of fruits.

Mr. Laughlin believes we are in the experimental stage, and thinks in time we will learn the exact methods to pursue.

Does spraying kill the honey bee? Mr. Williams believes in spraying as soon as the bloom falls, and every ten days or two weeks makes three sprayings.

Mr. Abbot spoke for the honey bee—that formerly before the spraying business was understood, many persons sprayed while the bloom was still on, but now as they come to understand it, there is no antagonism between the bee-keeper and the fruit-grower—the spraying always following the falling of the bloom.

The raspberry and blackberry instruction to beginners was introduced by Ralph Smith, who asked if there is anything better than the Gregg?

Maj. Evans—We are digging up the Gregg and planting the Hopkins; it lasts longer and is not so liable to break the market.

Secretary Goodman thinks the best raspberry is the Hopkins for canning and shipping. Thinks the Snyder and Taylor's Prolific the best blackberries, and the first should be cut back well; laterals to six inches of the main stalks.

Prof. Clark reports the Palmer doing best at the Experiment farm. Mr. Menefee said the same. Thinks Ohio Black Cap an excellent variety.

The Wallace always brings a nice berry and has been overlooked. Fruit very sweet and ships fairly well.

H. Speer—The Kittatinny rusts so badly that it is no good. Snyder does the same. Has found Hopkins the best and Shaffer's Colossal one of the best.

Mr. Laughlin would only plant in his locality the Hopkins.

Mr. Logan has Souhegan and Gregg; is satisfied with them, especially the first.

N. F. Murray indorses the Hopkins, and will discard most except it and a few Greggs. Would grow Souhegan for home use.

Query by Ralph Smith—What is the best length of shoots for both blackberries and raspberries?

Judge Miller said two to three feet for raspberry and four feet for blackberry, with two to four canes to the hill.

Mr. Gilbert would "tip" the canes in the center of the hill to three feet; if from the sides to 18 inches.

Mr. Lynn would be governed by the variety and strength of the canes.

Mr. McKown topped his too high and made a mistake; tops low now.

Maj. Holsinger—We should tip to make strong canes and have them at a convenient height, and he found $2\frac{1}{2}$ feet a very convenient height when the laterals have put out. For blackberries, about two feet for canes would give three to four feet at picking time. Thinks all varieties will sooner or later be subject to rust.

Mr. Gilbert plants raspberries 8 feet by $3\frac{1}{2}$ feet.

Prof. Clark has tried the Bordeaux mixture on blackberries, but is not certain as to definite results.

Mr. Durand asked for the comparative value of the blackberry and raspberry.

Mr. Logan pays same for both. The blackberry yields the larger amount of crates to the acre. Does not think there is much difference in the value of the two.

Judge Miller would give the Minnewaska and Erie a trial.

Mr. Menefee has both, but has not fruited them long enough to fully decide. Stone's Hardy is good with extra cultivation.

Vice-President Murray asked what measure of berries would make a pound of evaporated berries.

Mr. Laughlin asked the same.

Mr. Durand has evaporated some blackberries, and is satisfied there is no profit in them. In raspberries there is a profit; takes about three quarts to make a pound of evaporated fruit.

Secretary Goodman—We can afford to grow berries for canners at from \$1.20 to \$1.50 a crate, boxes and crates to be returned. It is better often to do this than to run the risk of shipment.

Mr. Durand would prefer to raise blackberries at \$1 per crate than raspberries at \$1.50.

Maj. Holsinger had tested the amount of green berries necessary to make one pound of evaporated fruit, and found that it required four and one-half quarts to make one pound.

WEDNESDAY, JUNE 3—2 P. M.

The afternoon session was opened by a discussion upon the stone fruits, the peach being the subject of most of the discussion. The subject was handled by about fifteen delegates, all giving their opinion in handling the fruit.

The blackberry and raspberry were next discussed. The best varieties were named and the reasons therefor. The discussion was spirited and interesting.

The afternoon meeting was largely attended, and was interesting throughout.

It was decided that the next semi-annual meeting should be held at Sedalia, in December, continuing four days.

PRIZES AWARDED.

The prizes for the best varieties of strawberries, best collection of strawberries and best exhibits of cut-flowers were awarded as follows :

Best five varieties strawberries, D. A. Turner, \$5.

Best strawberries for market, D. A. Turner, \$3.

Best strawberries for home use, A. D. Korf, \$3.

Box of largest strawberries, J. C. Evans, \$2.

Finest strawberries, D. A. Turner, \$1.

Best eating berries, S. W. Arthur, \$1.

Best all-purpose berries, \$2.

Best Cumberland berry, D. A. Turner, \$1.

Best Bubach berry, C. T. Zimmerman, \$1.

Best Warfield berry, A. Goslin, \$1.

Best Jessie berry, W. S. Fugate, \$1.

Best Windsor Chief berry, W. S. Fugate, \$1.

Best Captain Jack berry, P. H. Woods, \$1.

Best Haverland berry, G. E. Fischer, \$1.

Best new strawberry, J. W. Menefee, \$1.

Best basket roses, Hans Nielson, \$3.

Best hand bouquet, Hans Nielson, \$2.

Best table bouquet, Hans Nielson, \$2.

Best basket, Hans Nielson, \$3.

Best wreath, Hans Nielson, \$5.

Best collection strawberries, Samuel Miller, twenty-seven varieties, \$5.

J. W. Clark, Horticulturist of the State Agricultural college, had twenty-four varieties on exhibition, and was awarded a diploma for excellency.

REPORT OF COMMITTEE ON AWARDS.

Your committee find a splendid collection of strawberries by Col. J. C. Evans, of Harlem, Mo., that came in too late for entry, having been delayed by the express company. These berries were decidedly first in many particulars, but having been exposed to the rain, were somewhat injured by the treatment received, but still possessing especial merit.

Varieties—Jessie, the largest of any shown; Bubach No. 5, Cumberland, Warfield, Windsor Chief, Belmont, very fine; Willis No. 20, a very fine table berry.

We find from the Experiment station at Columbia, shown by Prof. J. W. Clark, thirty varieties of splendid strawberries, not shown for competition—many of these new and deserving of especial mention, among these, Lady Rusk, fine and promising; many of the old varieties fully sustaining their reputation.

We would respectfully recommend a special premium of \$10 to that veteran pomologist, Father Samuel Miller, for his indefatigable effort in the development of horticulture. Here are twenty-seven varieties of strawberries shown, some new and of fine promise. Deserving of mention are Townsend's Nos. 3 and 7, promising well; Nelwing's Gem, Mrs. Cleveland, Enhance, and his own seedling, No. 9, that for quality is very fine. Your committee feels the smallness of the premium inadequate to a due appreciation of his valuable collection, knowing the patience necessary to the development of the many new varieties he has on trial continuously. His experience, given as it is from time to time, becomes the property of the State, enriching her in a manner that time alone can determine. We think that were the Society to request an especial appropriation from the state for Father Miller's use in this direction, in the development of new varieties, great good would ensue to the State, and the State would in this way show her appreciation of his valuable services.

A very fine collection of apples shown by the Society, having been previously exhibited at the Exposition in Kansas City, Mo., during the fall of 1890, and then placed in cold storage. These apples are in fine condition.

Conrad Hartzell, of St. Joseph, has on exhibition fourteen varieties of apples, of which there are Ben Davis, Winesap, Geniton, White Winter Pearmain, Missouri Pippin, Willow Twig, Newtown Pippin and other common varieties, together with York, Imperial and Lawver, some of which were grown in 1890, 1889, 1888, and one basket of several varieties grown in 1887; kept in cellar under dwelling without ice or other preserving material, but simply kept by a special "plan" of his own, having used the plan successfully for many years.

FRANK HOLSINGER,
J. H. LOGAN,
J. M. RUSSELL.

Adopted.

REPORT OF COMMITTEE ON FLOWERS.

We, the undersigned committee on flowers, award the following premiums to Hans Nielson, florist, of St. Joseph, Mo.:

Best basket roses.....	\$3 00
Best hand bouquet.....	2 00
Best table bouquet ..	2 00
Best basket flowers.....	3 00
Best wreath flowers.....	5 00

SAMUEL MILLER,
MRS. ANNIE DUGAN,
MRS. HELEN LAUGHLIN.

FRUIT INDUSTRIES OF MISSOURI.

The fruit industries of our State—where shall I commence, and how shall I tell you in one short essay, as I should like, all about the fruit industry in our State, scattered abroad as it is among nearly three millions of intelligent and industrious people, spread out over a territory larger than all New England, located in the heart of the Union of States and in the geographical center of the fruit-growing belt of the continent, with soil and climate so admirably adapted to fruit-growing as to place it in third rank as a fruit-producing State, and destines it when fully developed to lead all other states, and stand unexcelled in the industry by any like area of country on the globe. To do this subject justice would require a volume. And we think that the time is not far distant when we should have just such a work, showing up in detail the fruit industries of our State. This might be done in connection with a work of instruction to beginners in horticulture, as suggested by our worthy Secretary in his last report, and made to serve a two-fold purpose—instruction to the beginner and information to fruit dealers and home-seekers. The fruit centers should be carefully written up, and a record given of the large commercial orchards and berry plantations. In this way we could at once meet and answer the many questions propounded to us so frequently through long letters that are being received continually from east, west, north and south by our Secretary and many others, the answering of which becomes a burden to the few engaged in the work.

When our Secretary last summer placed the value of the fruit crop for the year 1890 at \$10,000,000, many doubted the statement, thought it too high. This started people to thinking and investigating, and after the apple crop was shipped, one official of the Chicago & Alton railroad reported the amount carried over his own road, and the other trunk lines through the State reported to him by their managers at 5,000,000 barrels of apples, which, at \$2 a barrel, will make our \$10,000,000. Then add to this, if you please, our evaporated fruits, the product of our vineyard, berry plantations and other fruits, and who will for a moment doubt that the fruit industries of our State, last year, brought into the pockets of our fruit-growers and farmers at least \$15,000,000. This is certainly a fair showing and very encouraging—especially so if we remember that the Missouri fruit crop never fails; that it is just as certain as corn, wheat, oats or any standard crop. Then, if we should take into the account as we should, and properly appreciate, the great economy, health, pleasure and refining influences upon our own people of having a constant supply of choice fruits, we find something of such intrinsic value and not to be computed by or exchanged for dollars.

But are we, as sensible and progressive horticulturists, to be content with what has already been achieved? Have the fruit industries of this great State (an empire in itself) reached the limit of their growth and usefulness, the zenith of their glory? Will fruit soon become so abundant that it can't be sold for cost of production? Is it time to call a halt in this great enterprise? These and kindred questions are ever in the minds of the people, and to all we answer in the negative. And why? Because our country is growing rapidly. Cities are springing up all over our country. New markets for our fruit are opening up all around us. Our export trade in fruit is on the increase, and the demand for good fruit is now increasing more rapidly than our fruit plantations. Then listen: Do you not hear in the distance the dim rumbling tread of the coming millions, who will not only penetrate and occupy every now accessible spot of our country, but who will drain our swamps, irrigate our arid plains, dig down our mountains, develop our mines, build up our waste places, and give our country a vast and dense population—who under our system of government and free institutions will be the most intelligent, best paid, best fed, and best clothed nation of people on the earth? And they will continue to want their fruit and be able and willing to pay for it. In fact, we believe the fruit industries of our State at present to be in their infancy, just beginning to grow, and like a beautiful and thrifty vine, just beginning to throw out its young and tender shoots in all directions. And let us be careful not to tread, bruise or dwarf a single branch, but carefully train, cultivate, nourish and support each, till this great vine of industry shall fill our whole State so that every one may sit beneath his own vine and fruit tree and enjoy the richest blessings that earth can give to her inhabitants.

Horticulture has developed a literature of its own, not contemptible as to merit, and certainly a very useful one. Besides its own special books, reports and periodical papers, no agricultural journal is now published that does not give a considerable space for the purpose of spreading horticultural information.

The horticulture of to-day and its literature is as much superior to that of fifty years ago as is the tomato now grown to the "love apple"—the "tomattus"—of my boyhood. More than half of its present value is the growth of less than half a century. That much of its growth many of us have seen. We shall see—looking from somewhere—the Missouri of a century, yes, of centuries hence.

A vision of the Missouri of 1991 rises to my view. A part of the grand old forest has been saved from the axe of the destroyer. All over the prairie are groves that surround and protect homes that nestle among evergreens, shrubbery and flowers. The maples, the oaks, the elms and others of our native trees have their places here and there among all, and well-chosen adopted trees flourish by their side. Vines and climbers that have been proved cling to the trees or cover the arbors. Shrubby well tested and wisely selected is in its place on the lawns and in the parks. On the open ground, beside the homes, in the green-houses and in window and conservatory are flowers and ornamental plants.

The school-houses have each near by a large, open and turfed play-ground, and close around them the shade and shelter of many trees. The college and the university are approached by ways leading under dim old aisles of stately trees, and surrounded by botanical gardens under glass and in the open air. Men have learned to make of each cemetery a sacred precinct of beauty, a place in which not to forget the dead, but to suggest that this world is not all of life.

The country roads have ceased to be hideous with weeds, and have become highways of beauty, whereon to travel is gladness. The streets of its cities are wide and bordered with trees softly shining in the noon-day sun or glittering with

trembling rain-drops. The smoke and the dust are well nigh banished, and in the city the trees may flourish. The parks are large and many, and under the shade of the man-made forests and on the grassy glades the people may breathe and rest disport themselves and enjoy.

In no country home nor in any city market is there lack of any fruit in its season, and the stalls are full of the products of the market gardens. If any will not work he may starve, but for him who is willing to do his share there is no lack of any good thing.

South Missouri shall send to less favored regions the products of that peculiar soil of its vine-clad hills, where the land is genial with warmth and flowed with light: the peach from its sun-kissed plains where a myriad of trees bend beneath, their load of perfumed fruit, as luscious as any that grows on earth and as fragrant as the flowers; all manner of berries, each in its season, are everywhere, and of them there is no lack.

All over the State, but best of all on the old lake beds, grow the apples that are for the five millions who toil in the mines, the furnaces, the shops and the factories. The orchards do not cover principalities owned by an aristocracy, but are beside the people's homes and are owned by families. Having fed the ten millions of the people of Missouri, they are sending apples and apple products to all the earth.

The railroad and its extortions are read of in history, and the new transportation moves all. The world has passed through the worst of its second and greatest struggle, and justice is constantly winning successive victories. Of the millionaire and of the anarchist rising generations are already reading with surprise that they ever existed, or are listening as some old veteran tells the story of the contest that has left the country free from both.

The continental republic leads the nations of the world, and Missouri has become the peerless among the states. To such purpose it is your duty and mine to work. It should, it is, to him who is rightly constituted, highest pleasure.

W. R. LAUGHLIN.

DISCUSSION.

Henry Speer asked as to the thinning of peaches.

Secretary Goodman said the difficult thing was to get men who will take off enough of the fruit. He says, take off all you think you ought to and then as many more. They should not be less than four to five inches apart; six to seven inches would be better.

As to pruning peach trees, recommended February and March, or any time before they start new growth.

Judge Miller endorsed the same.

Mr. Lynn would not prune now. Mr. Milne would thin to six inches.

Maj. Evans would thin each kind and tree according to the amount from 25 to 95 per cent.

Maj. Holsinger suggested that if we followed eastern methods we would have no thinning to do.

Mr. Murtfeldt would trim the peach tree from the outside, and would not cut the large limbs, if necessary, close to the body at first.

Mr. Speers is trying to collect the native seedlings, and by budding, hopes to produce a peach that will stand our winters. Thinks we should look to this method rather than to take eastern varieties.

Mr. Russell, of Nebraska, a successful peach-grower, has five varieties that are regarded as successful in his locality. They are the Waterloo, Hill's Chili, Heath Oling, Alexander and Early Rivers.

Mr. N. F. Murray would use Hale's Early for North Missouri. Has found the white-fleshed varieties stand hard weather better than the yellow ones.

Mr. Gilbert would suggest for South Missouri, Crawford's Early, or Elberta, and Henrietta.

Judge Miller likes Alexander, Baltimore Early, Crawford's Early; Heath Oling and Parks' Late as the very best late peaches.

Mr. Durkes likes Amsden, Hale's Early, Stump the World, Smock's Free, Old Mixon and Crawford's Early.

Mr. Laughlin, of Holt, had planted the Foster; found it very large and fine; had the best of success with it; in color it is yellow.

Maj. Evans thinks the Foster better than the Crawford.

N. F. Murray is certain it is better, and bears better than the Crawford.

PEARS.

What varieties to plant in a commercial orchard, say of 1,000 trees. A variety of answers. Ten to twenty-five per cent dwarf; some one-half dwarf, and half standard—Durkes the latter.

Maj. Holsinger none.

Ralph Smith can't grow anything but Duchess, Bartlett and Keifer. The prevailing idea is that it won't pay.

Mr. Blakely spoke of an orchard of Bartlett (dwarf) that never paid.

N. F. Murray had success in planting Bartlett. Made it pay. Keifer is one of his best. The same of Duchess (dwarf).

From this the discussion drifted to early apples. Vice-President Murray urged that more attention be given to them in North Missouri for northern market, and would plant Queen, E. Pennock, Maiden Blush, Early Harvest and Red June.

Mr. Lynn thought there was already a surplus of early varieties.

Mr. Luke, of Trenton, has not enough early apples.

W. R. Laughlin offered the following resolution:

Resolved, That this Society requests the Congress of the United States to enact a law that shall compel all persons manufacturing or dealing in food products of any kind to label the same exactly what it is, and that shall prevent any food product from being sold without proper label or guarantee, and shall insure the correctness of all such labels or guarantees; that shall provide for capable officials

with power to examine, and if need be to analyze at any time, any food product in process of manufacture, or being offered for sale, and with sufficient further power in the premises; that the penalties for transgression of, or for evasion of or for neglect of the law, be made such as to effectually secure its execution.

Adopted unanimously.

NIGHT SESSION.

The evening session was opened with an instrumental duet by Misses Donovan and Stoddard.

SECRETARY GOODMAN'S REPORT.

Twenty-one years ago the State Society held its twelfth annual meeting in St. Joseph on November 29, and following. Many, very many of the members then known as our best horticulturists have passed away, and a few are still at work in the ranks of the Society. When we look back twenty-one years we see change after change. Where were forests and prairies now appear fruits and flowers, homes and railroads, farms and cities, manufactories and nurseries, gardens and stores, orchards and street cars, vineyards and town lots, until we are lost in the panorama which passes before us.

Horticulture has advanced in all departments, and kept pace with the other affairs of the world. Where hundreds of acres were planted then, thousands are planted now, and dotted all over our State are fine orchards, beautiful homes, grand parks, great nurseries, and wonderful green-houses and conservatories, producing millions of dollars worth of products annually.

One year ago, when I made the statement that the fruit crop of the State would bring ten millions of dollars, very few would believe it, or that it was worth ten millions more for home use. But if I should make the statement that now the various horticultural pursuits, the orchards, the vineyards, small fruit farms, nurseries, floral establishments and vegetable gardeners of the State produced annually over twenty millions of dollars, scarcely one would be willing to believe it. Yet it is a fact, and we will see the day when it will reach much more. Is it then a small matter, this cause of horticulture? Why should we be afraid of the State spending a few hundred thousands of dollars in building up a cause of such benefit to the State?

The growth then in the last twenty-one years has been a phenomenal one, and we look for a still greater one in the next twenty years.

Seven years ago again we met in this same city of St. Joseph, and under rather adverse conditions. The State was giving nothing for the help of the cause which was of so much importance to the State, and the Society was kept alive by a few enthusiastic men who believed in the benefits and advantages of horticulture.

In fact, from the organization of the Society, thirty-three years ago, the whole labor and expense of the work has been kept up by the fruit men of the State who loved the cause. To day, then, we see a much greater interest in our cause in almost every town and city than ever before. We find people everywhere who are taking an interest in not only one, but all departments of the work. We find some of our cities seeking park areas, beautifying their homes and lawns and streets more than ever before; we see hundreds of dollars spent now for trees and shrubs and plants where one was spent in the olden time. Every fruit-grower, and nur-

seryman, and florist, and gardener, and landscape artist, is now kept busy keeping up the demands of the times.

To-day we see some of the greatest fruit orchards in the world here in our own country; we find some of the most extensive nurseries and the most complete, the largest green-houses, the most complete gardens, the grandest parks, and the most beautiful lawns and private places known anywhere. I append a clipping from the "New York World:"

The millionaires of New York and vicinity are now lavishing thousands and thousands of dollars each year in propagating fine plants and bringing out something novel and new in flowers. All the eastern countries have been searched time and again for rare exotics, and there is great rivalry between the princes of wealth in this country over their conservatories and flower-pots. Hundreds of gardeners and landscape artists are now working most assiduously for new designs in flower pots and shrubbery work on the grounds of their employers.

There are comparatively few plots about the locations of the nabobs in New York, because there is little or no room. It is through New Jersey, along the banks of the beautiful Hudson and at Newport, that the handiwork of the garden artists will be shown in regal splendor this summer. Here the rich men of the great metropolis own magnificent mansions surrounded by acres of beautifully laid out grounds. It is doubtful if the summer residences and flower-gardens of the successful men of New York along the banks of the Hudson are equaled in any part of the world.

Flower gardening is here raised to an exceedingly artistic standpoint, and in no part of the two hemispheres are more beautiful plots of varied hue shown in such splendid settings. The arrangement of these fairy-like gardens is done in a similar way as an artist paints his picture. Everything is touched up with the most scrupulous eye for form. The greatest care is taken to preserve a due medium between the neat and graceful on one hand and the picturesque on the other. In the magnificent flower-pots art is shown. Few of the pots are straight, and there are no long, uninterrupted lines in them. Everywhere is variety in uniformity. The gardeners who superintend the floral decorations on the grounds of the New York nabobs must be artists of no mean ability. Men like Jay Gould, William Waldorf Astor, Cornelius Vanderbilt, J. D. Rockefeller, Dr. Seward Webb, Henry G. Marquand and other famous men of millions who love flowers passionately, pay high prices to men who superintend the laying out of their plots.

The chief gardeners receive about \$3,000 a year, including perquisites. They employ as many assistants as they see fit. At the summer residences of many of the rich men of Gotham a score or more of men are employed.

It is not only of the orchard and vineyard that we have to do, but all departments of this horticultural work. Primarily it is the fruit men who have kept up the work; but it should not be so, and we are glad that all departments of the work are uniting.

We do not claim any more enthusiasm or love for the work, or even better work than has been done by those who went before, but we claim the same earnestness and better organization. So that we meet here now, after seven years, to still discuss the important matters of fruit-growing, fruit packing, fruit transportation and marketing.

If any are here who wish to be heard, this is the time and place. If any have advantages to present of their location and climate, here do so.

The possibilities of the State in this line of work are only limited by the manner and cost of handling by the railroads and express companies. They can build up, tear down or destroy the work in any given locality by their treatment of the crop on its way to market and the cost of getting it there. The refrigerator car system seems to be a partial solution of the question, and yet not wholly. The railroads not only should furnish the refrigerator car system, but should attach

our fruit men in the different counties take hold of this matter the better for them and for the State work. If there ever was a time or place where good work can be them to their express trains, so as to make better time to the markets. Cool-air fruit-cars are as good as refrigerator cars if they are sent through in time, and there is no reason why they should not send from local points on the through express until the business becomes such as will justify a fruit train, as on the Illinois Central railroad.

The possibilities, therefore, are not limited only by the transportation companies. Our great State possesses such advantages for fruit growing of all kinds that there need be no failure in any department of the work. Many of our small towns can take care of a small amount of fruit, and will do so at paying prices, but care must be taken to examine your market before too extensive planting of small fruits or peaches. Ofttimes while our large cities are glutted with a surplus, many of our smaller towns have to pay big prices for all the fruit they use, so that judgment and care must be exercised in what fruits to plant as well as where to plant.

The possibilities of apple orcharding is no mooted question, and we have hundreds of thousands of acres of the most fertile and productive fruit lands all over the State specially adapted for special varieties of fruit and fruit-growing. From the northwest part of the State along the Missouri river our orchard lands extend to near the southeast corner of the State, where the orchard lands become fruit lands also, and melon orchards are the ones to plant.

A study of the adaptibility of soils and varieties is one of the most important subjects that can come before this Society, and under all the discussions I hope this view of the matter will not be lost sight of. In some places we can grow quinces or currants, in others, not; in some, the red raspberry to perfection, in others, not; in some, the plum and pear, in others, not; in some, one variety of apple, in others, not; in some, vineyards, in others, not; in some, apple seedlings and grape-vines from cuttings, but in others, not.

The solution of the transportation and market problem, then the adaptability must next be settled before success can be assured. I say, therefore, that the possibilities are almost unlimited, and we are seeing these advantages made use of day by day. We have the men also who are solving these problems, and it is only a question of time when we shall see our State covered with orchards, and buyers here from all parts of the country, taking our fruits in the orchards and packing and shipping in uniform packages nothing but the best fruits, and getting the best of prices for them.

I look to see the fulfillment of the prophecy that our great State will stand along at the head of the list in the line of horticulture, and that we have the men, the soil, the climate, the location, the markets to make this true.

The work of the Society continues more and more to be one of instruction and advice. To obtain knowledge in the development of our fruit industry in all its departments, and to dispense this knowledge, is one of the great works of the Society. I can point out men in our State, who from a union with the Society and information obtained from the members, have made a success of their undertaking, and, if not wealthy, at least independent and on the road to success.

To direct the inquirer aright and keep him from the costly blunders can surely be done if the one will only meet with our Society and discuss the matter he wishes to know. Ofttimes simply the discussion of a certain matter will throw new light on it, so that one will see his way clearly. Organization of our local societies we believe one of the best means of collecting and scattering knowledge, and the sooner

done it is now. It is not possible for the officers to do all this work, and any member of the State Society who finds the opportunity to organize a society or assist one should at once call help and do it. We will need all these county organizations when it comes to the World's Fair. Time to work and means of working are what we will need to make a showing for each of our counties then.

Fruit statistics are badly needed, but it seems hardly possible to get such ones as we want, and yet we must persevere, for we will want them when it comes to making a report for 1893. If we could get a list of the number of acres bearing apple, peach, pear, cherry, plum, grapes, blackberries, raspberries, strawberries, and the number of acres not bearing of each; if we could get the number of quarts, pounds or bushels of each produced per acre, and then each year get the per cent of a crop, we would have something definite to act upon. Added to this, if we could get the average price per quart or bushel, we could soon tell how much our fruit crop was worth. We will have to keep trying until we do accomplish it.

New fruits are coming to be an important item in our State, and in the right direction we are striving to find a better berry, peach or apple than we now have. A thousand men all over the State watching and working in this same line cannot but be successful in the end. Our experiment stations should work systematically to this end also. The many thousands of new seedlings should show us something in just this line.

The bugs and the birds are a most important factor in the life of the horticulturist and his success, and the Society are working not only at one place, but in an hundred different ones and in an hundred different ways. When we can fight these foes as intelligently as we can fight the weeds of our fields, we can be sure of success. Not the bugs and birds alone, but the fungus growth is becoming known so well that it is completely subdued in very many localities. The spraying machine is coming to be one of the best tools in the hands of the intelligent fruit-grower, and the field is just opening for us.

Fruit displays are one of the best educators we can use to let our people become familiar with varieties and modes of handling, and we should strive to have a fruit show at each of the meetings of our local societies, and a discussion of the merits at each meeting with not only our local societies, but with our sister societies, broaden our views and gives us new ideas and experience which we can adapt to our use here.

A fruit show at the World's Fair, and not only a fruit show, but a horticultural show; one which will embody all the departments of horticulture; one where we can have a home, a garden, a lawn, flower-beds, evergreens, forest, green-houses, an orchard of apples, grapes, pears, peaches, plums, cherries, berries of all kinds and flowers in profusion and an abundant display of all fruits during their season. This can be accomplished by taking the year before some four or five-year-old orchard trees, cutting around them and putting them in large tubs or boxes, and then in the spring of 1893 moving them to Chicago and planting in the orchard or lawn there to be made. There is no reason why we may not have a perfect paradise of a spot in Chicago, and a perfect place for displaying all the fruits grown in Missouri. Such an exhibit, well placed and well cared for, would awaken the attention of not only our own people, but of hundreds of thousands who would come to Missouri on account of the display there. I would have all our fruits put up in large glass jars for the purpose of continual show, and also as each season of fruit comes, have them on exhibition in the greatest abundance by a daily supply direct from the growers.

You say that this embodies an immense amount of work and expense, and so it does, but it will be the best advertisement ever made by the State, and the best investment. In the fall I should have a grand fruit and flower show for the last thirty days, such as only Missouri can make with her apples and flowers. Nothing would be more beautiful than a small apple, peach or cherry orchard ripening their fruits on the borders of Lake Michigan.

It is my opinion that we should ask for 15 per cent of the appropriation granted by the State for the World's Fair, and then we could carry out our plans.

It seems to me that some such plan, where all the products of the State can be combined in one whole, and everything except the live stock and machinery to be in the one building, would be acceptable to all; or, better still, if we could have ground enough to have our home, with houses and barns, and machine-shops, and mines and stock-yards all in one place, laid out like the State of Missouri, with some of its principal cities, rivers, forests and prairies, we would have the perfect embodiment of a display. I know of no man more capable to carry out such a plan than M. G. Kern, of St. Louis. All these matters are well for us to discuss, but the working them out, or any other plan, will be in the hands of the commission when the Governor appoints them.

Advertising our possibilities for the growers of fruits is one of the prime works of our Society, and we are doing our best to let the people of other states know that here we have one of the best countries, the best climate, the best land, the best mines of coal, lead, iron, zinc, stone, and the best stock, the best water and springs, the best markets, the best railroads, and altogether the best advantages offered by any State in this broad land of ours.

Advertising our fruits for buyers is but another mode of doing the work. Missouri has stepped far to the front in the last few years, and the attention of thousands of the fruit dealers all over our land has been called to our fruits, and we have been visited by thousands more. Good shipping apples will be well to the front for the next few years here in Missouri. Her name has reached every State in the Union and the foreign shore. Listen to the clipping taken from the "Country Gentleman":

Mr. D. S. Beckwith spoke of Missouri apples. He had spent three months in that State the past autumn, and found good fruit there. He was sure that the apples grown in Missouri would keep well if rightly handled. He handled 30,000 barrels. He bought by the orchard, and divided them into two classes—firsts and seconds—and when thus assorted, very few were left, they were of such universal good quality. He agreed with Mr. Powell that our apple lands, especially in western New York, needed to be better drained. This was one reason why our apples were so poor—too much wet. On the bluffs he found the best apples in Missouri, and the better the land was drained naturally, the better the fruit. Their trees bore young, and were set with low limbs, so that the apples could mostly be picked from the ground or from a small rise. The Winesap is one of their best; the Little Romanite is a fine keeper; the Missouri Pippin is a good one, and keeps well; the Geneting is extra fine; the Willow Twig is one of their best; the Ben. Davis is a fine market apple, but of poor quality. They are popular, because they keep well and look well. He went into a forty-acre orchard, and as he walked through it something snapped under his feet. Upon inquiry, he found that the owner had sowed small onions all over it to keep off vermin and insects. He had fine fruit, anyway. The smell of onions was very rank. If we compete with the western trade we must, in New York, work to produce the best kind of fruit. The freight to New York was 35 cents a barrel by car-load lots. The Missourians are not very particular about the size of the barrel. We used barrels which held three bushels. He exhibited fine specimens of the different kinds of which were grown in Missouri, all of red sorts, bright and healthy.

The transportation problem for our small fruits is the great bugbear now, and we must seek to have the railroads, refrigerator companies and express companies understand the very great importance of such treatment as will be of advantage to

both the shipper and the company. The proper handling of the crop and encouragement of fair prices will give them lots of it to do, while the opposite will destroy the supply in many localities.

The annual and semi-annual meetings, and the meetings with the State Board of Agriculture in the farmers' institutes, give us an opportunity for work in still the same yet different direction. Coming into close contact with each other, talking with each other, meeting new men with different ideas, discussing with our farmer friends for their instruction, opening up new avenues for development, pointing out new lines of work, are all incumbent on our Society and the local societies.

Ornamentation of our public grounds and instruction in that line of work is another phase which we are only beginning to comprehend. There is something more than planting trees and shrubs, and that is how to plant them and where to plant them. A series of lessons on this plan of work would do good everywhere, and we must strive to give such information as will make a change in our street-planting, yard-planting, bedding plants and house-building. We can only begin to do this work, but it must be done and will be done in time. We hope that our pamphlet, which we wish to send out on fruit-growing, may embody not only berry-growing, but orchard-planting of all kinds; ornamental planting on our public grounds, in our yards, on our streets, forestry in its beginning, green-house work and nursery-growing.

Did any one ever ask you what was the work of our Society? Have I opened up to you anything in the line of work? Does there seem to be anything to do? Has the Society anything to accomplish, or is its work done? And yet, this is only a beginning. A unity of our work with the State Agricultural college and its department of horticulture, and especially the Experiment station, seems to me one of the ways in which we should work, and we can work to their advantage as well as our own. The experimental work in horticulture interests us more than any other, and is a very important part. We need not only one station, but a number of them over the State to carry on experiments in different soils and locations. With the amount of money now given to the station, we should be one of the best equipped in the country in green-houses and appliances.

The general upbuilding of the cause of horticulture of course is the end to be accomplished, and we have to strike all along the different lines of work in order to do it. Our aim is to have better orchardists, better vineyardists, better florists, better pomologists, better nurserymen, better gardeners, better foresters, better seedsmen, better landscape gardeners—in fact, better horticulturists. We want them to know that there is room for thought and study as well as work, and that it is a pleasure to follow it in its newly awakened form. If you wish an opportunity to grow and study and learn and succeed, you will find plenty of undeveloped field for the employment of your best powers in horticulture.

Our report, although expected some months ago, yet it is just now that the members of the Society are receiving it. Of its contents and its value you will see that there are very many points of discussion of great value to the fruit-grower. It is larger than I expected or intended. The copy was all in and the "Outlines" of Miss Murtfeld, were not expected to be used, but at the last moment it was decided to put the "Outlines" complete in the report and it took 132 pages to complete.

I think that this is the most valuable report that we have ever issued, for no report ever contained such valuable lessons on entomology as does this one. Miss Murtfeld deserves the thanks of the Society and its good will forever. She has

worked long and faithfully in this work for beginners, and I look upon it as of more value to our people than any other publication given to them in years. We have an opportunity now of becoming somewhat acquainted with our insect friends and foes alike, and of using this knowledge to our advantage. We can but give unstinted praise to the work of Miss Murtfeldt, and I hope that this Society will try and recompense her in some manner for her efforts in this direction.

We had 1,000 copies of her work bound separately, 500 in cloth and 500 in paper, and a part of these will be given to her for her individual work. The State Board of Agriculture will also have the same number, and will also give her something, but not one-tenth part of the value of the work will she receive, and we should do all we can for her. It is a disgrace to our State that we have no State Entomologist, and as long as we have none we should see to it that Miss Murtfeldt gets all the support we are able to give her.

HONORARY MEMBERS.

I would like to suggest to our Society for their enthusiastic work in the cause, Brother Samuel Miller, of Bluffton, the fruit-grower; M. G. Kern, of St. Louis, the landscape gardener, and Miss M. E. Murtfeldt, of Kirkwood, the entomologist. I think that these three deserve this honor at the hands of the Society for their faithful and earnest work in the cause of horticulture.

The beautifying the grounds of our colleges which this Society has taken up was well carried out on our last Arbo-day. At Marshall a beautiful college campus of thirty acres was planted with about 1,200 trees, donated by the different members of our Society, and it was to the delight of not only the school, but the people of the community. Ten years will cause them to think much more of it than can be done to-day. At Kidder, some 300 trees were planted, and there too, years after, we will see the results of our efforts in the beautiful groves. At Clinton, a small planting of shrubs and smaller trees was made on Baird college grounds, by Mr. G. E. Kessler, of plants donated by our nurserymen there.

All honor, then, to the names of those who have so generously given the trees for the planting, and to Mr. Kessler, especially, for laying out the grounds. The following are the names of those donating:

J. W. Turner, Meadville; M. L. Bonham, Clinton; G. H. Shepherd, La Monte; J. T. Stewart, Blackburn; Stark Nursery Co., Louisiana; Holloway & Speer, Butler; C. I. Robards, Butler; E. A. Barchart, Clinton; A. Ambrose, Nevada; N. F. Murray, Oregon; J. C. Evans, Harlem; L. A. Goodman, Westport.

DEATHS IN THE SOCIETY.

Since our last meeting, almost immediately after, we learned of the death of our former Treasurer, D. S. Holman. Our sympathies went out to the family, as did those of every member of the Society. Friend Holman's name appears among the list of early members of the Society, and he has always been a lover of the cause; he was the oldest member of the Society, and yet an earnest worker. The President and myself were present at the funeral to help lay him away and attest our sympathy.

Not long after, we find our friend Patterson having a stroke of apoplexy, from which he never recovered. Another earnest worker gone, and our sympathy goes to the family in bereavement.

The settlement with our Treasurer was made, as supposed, and the balance of the means in his hands was paid to our President, which will be paid to our Treasurer when elected at the meeting. Or, if by action of the Society, it be put into a

fund for its future use, to be safely invested and called for when needed. We will have call for all the money we can get when the display in Chicago is made, and it is well for us to keep ourselves in readiness.

The publication of the "Outlines of Entomology" for beginners is the opening of a field which should be filled up, and a series of them, or one to fill the demand for those beginning the study and work, planting fruits, orchards, nursery or ornamentals, landscape gardening or floriculture. A pamphlet containing instructions on these points would be of much use to us in answering questions. It is our aim, therefore, to begin such a work this summer, and next winter to complete it, thus having quite a guide-book to fruit-growing.

And now, dear friends and members, I have taken a full half hour in telling you of what we are doing and what there is to do. Have any new fields been opened to your minds? Has anything new been suggested? Do you see that there is plenty to do? and don't you know that Missouri has the men to do it? And above all, does it not seem to you that there are new fields for study and thought opening? Do you think that we should not make such a drudge of all our work, but that sometimes we should enjoy part of it as we go along?

And so, let us continue in our work, determined to make it a success in whatever line of work we are engaged in. Our motto is forward and not backward, upward and not downward, right and not wrong. With the men we have, and the country we have, and the climate we have, and the soil we have, I look forward to the day when Missouri will take her stand at the head of the list of states, and that will be with no light effort, and, in the end, no light honor.

So bidding each one of you an enthusiastic welcome in the good work, and an earnest wish for the success of each one of us individually, and all of us collectively not only success in the money matter, but success in thoughts, in study, in social standing, in morals and in godliness, a success in all our honest endeavors, I will leave the matter in your hand with faith in the cause to the end.

At the close of the Secretary's report, Mr. Blake read an extract from the "Country Gentleman," praising Missouri's apples. The article was one exceedingly complimentary to the State.

A resolution was next introduced requesting the Legislature to enact measures for the prevention of adulterated jellies, vinegars, etc. The resolution was unanimously adopted.

A song was next rendered in an exquisite manner by Miss Martina Martin.

A paper upon "The American's Home Life" was read by Mrs. George E. Dugan, of Sedalia. It was very interesting, and was a strong plea for better homes.

Miss Clara Moore next recited the "Fall of Pemberton." Her articulation was splendid, and her selection was well received by the audience.

C. C. Bell, of Boonville, talked to the audience next upon "Marketing Our Products." His talk was entertaining and full of sound sense.

"The Rose, Best Varieties for Yard Planting," was the title of a paper which was read next by Mrs. H. C. Ramsey, of Kansas City. Her effort was well received.

On account of the lateness of the hour, the session having opened late because of a storm, two musical selections were omitted, and the program closed with a promenade drill by a number of young ladies of Dr. Martin's school.

THE ROSE.

When the great Creator conceived and planned the garden of Eden, and planted therein the most beautiful of flowers for the pleasure of man, it is not to be supposed that he omitted so important one in his floral kingdom as the rose; and as his creation was perfect, doubtless Eve was the first, as she strolled through her Paradise, to be dazzled by its splendor and completeness. As to the mention of it by this name, we have from the prophecy of Isaiah and song of Solomon testimony of its flourishing and blooming in beauty in the plains of Sharon; they both refer to it in figurative speech. These grand patriarchs have given to it almost a sacredness by comparison in beauty with the coming of Christ and his kingdom. If they whose minds dwelt on the highest table land of thought should hold this flower in such high esteem for beauty and perfection, should we wonder that it has retained its popularity, and that its praises have been sung since Solomon first set it to music.

For the influence of these beautiful monitors, no one who associates with them can deny that nothing lives higher in thought. While from the earth, yet not earthly, in looking into their faces they seem to be the medium through which we commune with our great Creator. Every unfolding bud, the tinting of each delicate petal, reveals, more than the ordinary things of his creation, the wonderful conception and ability of our Father, and his indulgence to his children, in giving them so much pleasure. Never do I commune so much face to face with Him as when alone in my own small garden. This is indeed my place for meditation; my closet for prayer; for never do I feel so much shut in from the world as when with these silent messengers of His. Though most of the faces of this Society are strange to me, I feel that I have never before come in contact with a company of purer lives than those I am associated with to-day; for no man or woman can be a florist or horticulturist without being the better for it. No temporal vocation that has the refining influences of this. They are artists of field and garden, pupils of the great Master, through whose celestial hands are produced picture as removed from Raphael or Rubens. Theirs is a busy life, keeping pace with each season, with its return every year producing some new picture of mind.

True to nature, in ancient history as well as sacred, the rose figures conspicuously. In the great struggle for the English throne, between the Yorks and Lancasters, she held the fort, and has given name to one of England's most noted contests, "The War of the Roses," and has been adopted as her national flower. Having been first in war.

We claim her to-day as first in grace,
And as I hold thee now in fond embrace,
And drink in deep and long thy sweets of breath and face,
Oh, if I could, I'd voice the world for thee,
That thou the queen of Flora's host should be.

There are few genera in which so much confusion exists in regard to species as this flower. In its wild state 180 species are known to exist; even in this state it is variable and many more are mentioned, but our best authorities admit only thirty of this number. In the whole floral family there is none with such susceptibility of variety from hybridizing as this; and our great rosarians, which France, Germany and England have produced, have divided this family

into eight important branches, each sending out a host of descendants, all trying to rival their aunts, uncles and cousins in beauty and merit.

As to the color of the rose, there is a legend: be it true or myth, Stoddard has set it to the following pathetic lines:

Why are red roses red?
For roses once were white:
Because the loving nightingales
Sang on their thorns all night—
Sang till the blood they siled
Had dyed the roses red.

While we are disposed to expatiate on the high merits of its beauty we must not forget that to yield her share of usefulness as well. Her medicinal qualities have long since been known and utilized by the medical word; and in the Southern states the great hedges of the Cherokee and Dog rose are known to be a half century old and are still in full vigor.

In the oriental countries they are grown and cultivated in fields where the attar of rose is secured, and the cultivation and gathering of rose petals is to the Persian peasant as much the means of his sustenance as the cotton-field of the South is to the negro.

Those who have given their time and experience to rose-growing on large lawns and gardens have great advantages over us of the city, with only a few feet of ground in our kitchen door-yards in which to plant; for here we must plant if we ourselves reap the pleasure of them, otherwise the unfolding buds of the front, so tenderly tended, are carefully watched and gathered while we are dreaming of them. I imagine that the lonely saying, "the early bird catches the worm," originated with just such an alliance as this; and I will add that the early boy gathers the rose.

For me to offer any suggestion in regard to soil before such an audience would seem superfluous. It has been conceded by all with successful experience that a good quality of woods earth, mix a reasonable amount of sand and at least a monthly application of liquid manure, with all suds from the laundry, and a daily deposit of tea and coffee-grounds from the table: this, with a sunny location, is all that is needed, with an occasional stirring of the dirt for the growth and bloom.

As to the destruction of the insect enemy of this flower, I am as much at sea as when a novice in rose-growing—especially the innumerable, indestructible, irrepressible aphids, or grain-fly.

The strongest branch of this royal family is known as the Hybrid Perpetual. For the benefit of amateurs, I make the following suggestions, for I find most of them are under the impression that all hybrids are perpetual flowers, while one of more experience knows too well to the contrary—that our best rosarians have discarded this name and adopted the word "Remontants," a French word, meaning "growing again;" we heartily agree.

While our amateurs are delighted with the gorgeous pictures on most of the catalogues, I would suggest that you go slow in purchasing these high-priced novelties until fully tested. I have contracted for many such, and paid for many disappointments. The following list of Hybrid Remontants I have found to give more bloom and satisfaction than any others I have tested of this class:

Mad. Chas. Wood, Coquette des Blanches, M. Masson, Mrs. John Laing, General Jacquimnot, Coquette des Alps and Emily Peel.

The next most important branch is the hybrid teas, a cross between our Remontants and Ever-blooming. Of this class the La France, B. of Stapleford, Dinsmore, Triumph de Angles, P. Guillott, Mary Fitzwilliams, I find most faithful in their

duties; next, the Bourbon, obtained from the roses of the Isle of B. crossed with the China and Damask, which produce a magnificent race; while they are not quite hardy, with light protection they winter well.

The following varieties, which do not need my testimony for their merit, are old and well known: Hermosa, Malmaison, Appoline. Next the Noisette, called after their originators Noisette, of Charleston, South Carolina, who secured them by a cross from the wild running rose with other varieties.

While our loving friends of the South have their Lady Banks, La Marque, Marechal Neil, which climb high in the sunlight, and laugh and swing over their more lonely sister, we of this varying climate must be content with our old favorites, Prairie Queen, Baltimore Belle and Lady Washington.

Next come our Tea Roses, of such endless variety of coloring that it is hard to select. Some of the following list I have kept out in the open ground from year to year, with a slight protection of dry straw held down by some convenient weight, and the roots well earthed up: Princess Verd, Marie Gillot, Fearle, Mad. Welch, Bride, Sunset.

The lilliputs of this family are the Polyanthus. They are little gems for constant bloom, and I find them more hardy than the Tea Roses.

I have planted but one novelty this season—Mary Washington. As yet she is frail, delicate, but I hope in a few seasons to be able to sing her praises, with Lesuer, Child and Dingee, each claiming we are the first to introduce it. I have heard it mooted that she is not Mary, the grand-mother of our country, but the real Martha herself, with a little perfume added to her trousseau. In all this host of beauties it would be hard to decide the real queen; yet I have seen her—the ideal rose—Baroness Rothschild. Like the noted Jewess for whom she is named, her wealth is so great that our own Gen. Washington, Duke Alexis, Empress Eugenie, Crown Prince, and our own loved La France, had better consult her for a loan before going to war in the garden.

As a child I began the botanic study of flowers very young in my grand-mother's garden, where grew many varieties of the old Annual. Each morning of rose-blooming seasons I would receive this injunction: don't pick the roses; you know we only have roses once a year.

Now in this garden there grew one especial favorite that my venerated grand-mother brought, she said, from the blue-grass home by the overland route. This was the Hundred Leaf. Under no consideration was I to gather this. With this information, the same ardent desire to test its merits seized me that had existed in the garden before; and after the arduous task of wisping the old wicket gate, I entered, and securing an apronful of the largest, I determined to see if a rose really could contain a hundred leaves, and hid behind a clump of high old gooseberry bushes. I was detected at my botanical task of dissection by the foraging cook in search of early vegetables, and it was then and there that I was made to believe that I was not my mother's own child, but the veritable imp of her whom the serpent beguiled. I had brought reproach on the name by disobedience, and now, since she came to remember, for several days she had missed the biggest gooseberries from the bushes, and she was the very angel herself who had come to drive me out.

And forth in disgrace, like my Mother Eve,
By this ducky hand I was led.
It was not the fruit nor the hundred leaves,
But the thorns I found instead.

MRS. H. C. RAMSEY,
Kansas City, Mo.

THE AMERICAN'S HOME LIFE.

To theorize on this subject will be no easy task, as it is rather a theme for discussion than a matter from which to evolve an essay.

The home life of the American is as diversified as his character is unique and individual. There are no distinct groups which we can study and from them deduct our inferences. It would be less difficult to speculate on what his home life should be than on what it is, as in the latter case we must of necessity form a superficial opinion.

The American retreats into his home, and you cannot follow uninvited, to see how he conducts himself there. His home is his sanctuary; if he shuts the door we cannot discover whether he is behaving properly or not.

Home is the most sacred spot on earth—a place where all that is noblest and best in us stands revealed, and all that is worst is mercifully hidden from prying eyes.

The most agreeable man we meet in society may not always be the most loving and kind at home. Some persons need the restraint of strangers to keep a savage, untamed soul in bounds. The average American is always somewhat of a hypocrite, so that it is only in the presence of his family that his real nature is made manifest. With his street coat he puts off his company manners, clears his aching throat (he is a great talker away from home), assumes his every-day, at home tone of voice, unchains his chafed and fretting soul, and feels that Richard dare now be his honest self again.

Agriculture is the most independent of occupations, hence farmers are usually truer to nature than most men. In the competitions of trade in towns and cities, a certain amount of policy is deemed necessary; therefore a man will sometimes avenge himself for a period of exaggerated suavity and hypocritical politeness, by going home and swearing at his wife and children. It is a mean way of getting even, but he has been compelled to be gracious when he wanted to swear; he hates himself for it, and somebody has to pay the penalty, and so he is cross and cruel to his family. In the home the souls of men walk about in majesty, and it is sad to remark that this majesty is sometimes of a Plutonian quality. No reference is here made to hen-pecked men. They are not supposed to walk at all; they go in at the key-hole, and then creep carefully about, avoiding the observation of the mistress of the house as much as possible. Pluto's subjects are not all of the masculine gender.

In his home the surly man growls, the genial man smiles, the thoughtful man is quiet, the studious man reads, the avaricious man counts his gains, the sluggish man sleeps, the gluttonous man eats, and the quarrelsome man swears and swaggers. His home is his castle, he is shut in from the world, he can do whatever he pleases.

And yet, in spite of these diversities, there are a large number of happy homes in all parts of our land, and they are the safeguards of our liberty, the foundation on which rests all that is worth preserving of American institutions; they are the pride, the strength, the glory of our nation. There are also—sad to say—a large number of places where families reside, but which are in no sense real homes, and from these dens of dissatisfaction emanates much of that menacing influence which threatens to disrupt and destroy our country.

The American's home life is a part of his very inner existence; it is the outward manifestation of the emotions of the soul. An ambitious man builds a large house, improves his grounds, marries a very stylish woman, and says to his friends, "come and see my place, it is the finest in the country."

The genuine home-builder puts up a little cottage, marries the girl he loves and who returns his affection, and though he usually builds a large house in course of time, he never thinks of inviting his friends to inspect it, but cordially invites them to visit him in his home, and says, "I should be pleased to introduce you to my family."

Americans are such a busy people, that frequently they do not take time to enjoy the homes they have earned by hard toil, and have fitted up just to their taste.

Our country is a great hive of industry; everybody works (except the tramp), from plowman to millionaire. How we rush, and scramble, and push with frantic eagerness to gain wealth, hoping that with much money we can buy much happiness. But it is not so: the anxious votary of Mammon finds at the last that the God he has worshiped can give him neither rest nor peace, but only that monotonous cry of the "horse-leech's daughter: more! more! more!" The pursuit of wealth is carried to such an extreme that the number of those who do not take time to lie down on their beds and die in the old-fashioned, respectable way is daily increasing. Men tumble over and yield up the ghost wherever they may happen to be, at the desk, on 'change, on the street; the overworked machinery suddenly stops and all is at an end, except the funeral, and how quickly forgotten.

Yet Americans think a great deal of home; they talk about it, spend money in beautifying it, but only occupy it as a sort of high-toned boarding-house where they take their hurried meals and rest just about one-half the number of hours nature requires, and then they hurry off to prostrate themselves before that remorseless juggernaut which is grinding their souls to an impalpable powder under the name of "business."

The poor creature who marries a society belle and always lives in some fashionable hotel, has a little sadder time of it than most other folks; you can always pick him out in a crowd because of the forlornness and homelessness of his appearance; he does not deserve too much pity either, for he ought to have had a distinct understanding about housekeeping before the ceremony was performed; but he was very much in love then and was so afraid that Seraphina would say "no" and now, "'tis everlastingly too late." Home for him is a hollow, meaningless word.

In the earlier days of our American civilization homes seemed to spring up spontaneously; men in those old times were glad to get wives by paying for them; they did not have much money, it is true, but they raised tobacco which they were glad to exchange for a wife, dearly as they loved the weed: think of it, ye old bachelors of to-day, and blush for your lack of manly chivalry! Some of you would be loath to give up one choice Havana for the loveliest maiden in the land.

Our dear old Dominion forefathers were willing, nay anxious, to become benedicts, and so they bought the sweet, rosy-cheeked English peasant girl, and founded the F. F. V.'s and the rest of our American aristocracy.

We are all proud of them, too! they were brave men, and their wives were loyal and true, and they built homes in the best and truest sense of this divine word. The real home-builder has always in his mind an ideal picture of home. He has orchards and ornamental trees, flowers and all beautiful things in that sacred air castle, which most frequently develops into something real and as lovely as his long-cherished dream.

Every American's home should have a Christian foundation; it should be built upon the rock, as our Saviour suggested, and not upon sand. If more homes were thus founded and fewer built upon sand, the divorce courts would not very frequently receive patronage.

A young child, who was the guest of a Christian family for a day or two, just before leaving for home sadly remarked: "We haven't got any God at my papa's house." Sorrowful epitome. Observe, the child said "house," not "home." Every home must have God in it or it is not a home, but only a house. The Christian life must be real and not assumed, or somebody will discover the cheat.

A lady was recently asked if her husband was a Christian; she gave this answer: "When I hear him speak in church, I think he is; but when he is speaking at home, I think he isn't." How much there seems to be of this indefinite kind of religion.

From Christian homes come those noble men and women who are most perfectly equipped for the responsibilities of life. They are strong to do battle for the right, and they found the homes of which our entire nation is so proud:

In this era we frequently meet the question, "is marriage a failure?" The question is a disgrace to our civilization, and shows a deterioration both in sense and sentiment.

Foreign writers of the Ouida and Mona Caird type, not to mention Zola and Tolstol, shamelessly attack the home life—that foundation upon which rests the perpetuation of our national life and liberty.

Perhaps we should not so much object to these theories, so false and foolish, were they kept in their own land; but when they begin to deluge our blessed country with their trash, every home-lover should protest.

Can it be possible that notwithstanding our much boasted nineteenth century progress, we are progressing backward?

Whatever does injury to American home life does injury irreparable to the nation. Whoever pulls away one brick from the foundation of American institutions should be held as a foe to our national existence.

There are many enemies to marriage, that consecrated ceremony without which we should have no homes. Were these agitators to convince a majority of our young people that marriage is a failure, we should suddenly plunge into darkness and desolation; chaos would reign supreme in the space of one century. In departing from the simplicity of earlier times, the simplicity of dress, of living, and of labor, many evils have arisen, some of which threaten permanent injury to the American's home life. A desire on the part of many women and girls for a career outside of the home, a growing tendency to shirk the responsibility and care of rearing families, and of house-keeping—any and everything which causes dissatisfaction with home and its surroundings by the feminine portion of the household—is something to be seriously deplored, and if possible corrected.

Many young ladies in these days are taught to regard matrimony as a possible catastrophe which menaces their future, and not as something devoutly to be wished, to look forward to, and anticipate as the highest good for themselves and humanity.

The founding of a Christian home is no mean or insignificant thing, to be regarded with contempt or scorn, but it is, or should be, the ultimatum of every pure young man and maiden's hopes. They should give to this subject their noblest and best thoughts, and the highest of their education should be a preparation for its sacred obligations.

Every young woman should be taught that to be a good wife and mother is her highest and holiest duty, and every young man should be trained to understand that the most imperative obligation of his life is the one of being a true, generous, kind and considerate husband.

Perhaps many present will object to the statement that the average boarding school is an enemy to American home life; and yet what thoughtful person is here

who has not in mind at least one promising young girl whose future usefulness has been marred or utterly spoiled by a few years' training in some fashionable boarding school? Whatever unfits a girl for home life and home duties is likely to make of her a wandering star which is almost sure to go out in darkness.

A white-ribbon society should be formed in every home circle; social and moral purity should be a part of every boy and girl's education.

Our sons should be as carefully guarded from sin and temptation as are our daughters. We hear a great deal about the seducer, but little or nothing concerning the temptress. It is common to write, speak and think of women as the victims of men, but we never mention the fact that many inexperienced young men are the victims of designing women.

Our boys need guarding as well as our girls. Let us try to remember this truth.

Another enemy to our American home life is pernicious literature. Novels of the sensational, over-drawn type lie promiscuously around almost every household; the young people read the exaggerated tales, believe them, and quickly become disgusted with the humdrum staleness of their home life. They grow to despise plain, common-place things; they hate their environments; they are heroes and heroines just like those in the books; their parents are cold-hearted or cruel, and their surroundings not at all what they merit; they are not appreciated, are having their holiest feelings trampled upon, and finally end by running away, and often by going to sure destruction. All this comes of injudicious reading, and it will pay a handsome per cent in home comfort for every parent to select pure and harmless literature for the unformed intellects in their families, as sensational stories have injured irreparably many American homes.

When we come to fully comprehend that the honor and perpetuity of our nation is entirely dependent on the influences of home, we shall be more watchful of our hearth fires, and more careful to exclude everything from our homes of a pernicious character. Everything that is pure and good, everything that is high and holy, should be carefully fostered in the home, because the American's home life is America's salvation; and whoever founds and maintains a Christian home does no small thing for the advancement of righteousness and the uplifting of humanity. Build homes, no matter how small they are: a cottage may contain more love and peace than a mansion, though a mansion dedicated to God and human progress is always a grand place. Would that every American's home were a temple dedicated to Him who hath gone to prepare for us a mansion in the city eternal. From these pure homes comes the real wealth of our nation, for true riches do not consist in silver and gold, but in honest living, in moral integrity. The American's home life is the beacon light of his liberty; then let him see to it that it is a life of love, truth, temperance and morality.

MRS. GEO. E. DUGAN,
Sedalia, Mo.

THURSDAY, JUNE 4—9 A. M.

Meeting was opened with prayer by C. W. Murtfeldt.

The World's Fair was a subject that occupied a very important place in the session. A protest against the appointment of Mr. Maxwell, of California, as Chief of the Department of Horticulture, was made as follows:

Resolved, That the Missouri State Horticultural Society does hereby most earnestly protest against the appointment to the office of Superintendent of the Department of Horticulture for the Columbian Exposition of any man who is not a practical horticulturist of long experience and an organizer of proved ability.

Resolved, That our first choice for that position is Parker Earle of Illinois.

Resolved, That there is no need of appointing to the place any unfit or second-rate man, while such men as Dunlap, Ragan, Garfield, Furness or Brackett are to be had.

This resolution called forth some spirited remarks from the delegates, the speeches impressing the fact that Mr. Maxwell, who has been suggested for the place, is not a competent person for the position; that he is a wine merchant instead of a horticulturist, as has been stated by the daily press, and that the horticulturists of the entire country are opposed to him.

Upon taking a vote it was found that the society was unanimously in favor of the resolutions, and against Mr. Maxwell. It was then decided that copies of the several resolutions above printed be signed by the officers of the society and forwarded to Director-General George R. Davis, of the Columbian Exposition.

Several stirring speeches were made by different delegates, after which the following resolution was introduced and unanimously adopted:

WHEREAS, By reason of an act of the Legislature appropriating \$150,000 to be used in making a proper and creditable exhibit of Missouri's products at the World's Fair; and,

WHEREAS, By said act of the Legislature there was created a commission of seven to be appointed by the Governor, whose duty it shall be to attend and supervise the collecting and arranging of said products; and,

WHEREAS, Every true Missourian feels a just and commendable pride in the varied resources of our great and growing State, and believing in the time-honored right and custom to petition, while we take pleasure in giving expression to the full and complete confidence we have in the sound judgment and excellent business tact displayed at all times by our active and brainy young Governor, we would nevertheless venture to give expression to our wishes in the appointment of one of said commission; therefore, be it

Resolved, That it is the sense of this body that Major J. C. Evans, of Kansas City, as a representative of the great fruit-growing and horticultural interests of the State, be appointed a member of said commission; be it further

Resolved, That a copy of these resolutions be respectfully forwarded to his excellency, the Governor, David R. Francis.

The following resolution was next introduced and unanimously adopted:

Resolved, That we will do our very best, as representing the horticultural interests of the great and growing State of Missouri, to make such a showing at the Columbian Exposition in Chicago as to be a fair representation of the capabilities of our soil and of the skill and energy of our best horticulturists in the departments of fruit-growing, floriculture and landscape gardening; and that we ask for twenty per cent of the amount provided by our State Legislature for this purpose.

The reports by counties were especially encouraging, most of them showing a wider range of products than last year, while a few counties only showed a slight falling off in apples, believed to be owing to the excessive bearing of last year. This, however, will be more than over-balanced by new orchards that will come into bearing this year.

TREASURER'S REPORT.

		CR.	
June 1891....	Warrant No. 164—Salary Sept., Oct., Nov.....	\$200 00	
	Postoffice bill (No. 24).....	15 76	
	Freight (No. 21, 22).....	1 83	
	Printing (No. 23).....	11 25	
			\$228 84
	Warrant No. 165—Expenses at Clinton (No. 25)..	5 63	
	Expenses at Sedalia (No. 25)..	6 85	
	Postoffice bill (No. 26)	12 88	
	Evans & Goodman (No. 27)...	13 50	
	Express (No. 27).....	2 85	
			41 73
	Warrant No. 166—Printing (No. 28).....	31 75	
	Express (No. 28).....	2 25	
	Exp. to Jefferson City (No. 29)	13 25	
	Exp. to Clinton (No. 30).....	38 05	
			85 30
	Warrant No. 167—Plates and festooning (No. 31, 32)	19 50	
	Salary, December.....	66 65	
			86 15
	Warrant No. 168—R. E. Bailey.....	25 00	
	Premiums	100 00	
	S. Miller, expenses.....	6 50	
	Express.....	6 10	
	J. C. Evans	9 75	
	N. F. Murray	14 25	
	Mrs. Dugan.....	5 00	
			166 60
Jan. '91.....	Warrant No. 169—Postoffice bill (No. 1).....	22 29	
	Exp. at Jefferson City (No. 3)	12 05	
	Exp. at institute (No. 2).....	2 60	
	Express (Nos. 4, 5, 6, 7, 8, 9) ..	9 30	
			46 24
	Warrant No. 170—Printing (No. 10).....	6 00	
	Pencils (No. 11)	2 00	
	Salary, January.....	66 65	
	Postoffice bill (No. 12).....	9 41	
			84 06
March 9.....	Warrant No. 171—Chas. Patterson, delegate....		23 75
	“ “ 172—Postoffice bill (No. 14).....	5 47	
	Printing (No. 15) ..	6 00	
	Tel. and exp. (Nos. 16, 17)....	1 95	
	Expense (No. 18).....	12 55	
	Salary, February.....	66 65	
			92 62
April.....	Warrant No. 173—Miss M. E. Murtfeldt.....		50 00
	“ “ 174—Expense as per Exhibit A....	60 58	
	Salary, March.....	66 65	
			271 24

May	Warrant No. 175—Postoffice bill (No. 23).....	\$32 99	
	Fruit reports (No. 24)	15 00	
	Printing \$5, express \$1 (Nos. 25, 26).....	6 00	
	Expense at Marshall (No. 27).....	10 90	
			\$64 94
May 25.....	Warrant No. 176—Exp'se to Springfield (No. 28)	4 20	
	Postoffice bill, May (No. 29).....	31 71	
	G. E. Kesler, expense (No. 30).....	3 25	
	Printing (No. 31).....	28 20	
	Salary, April, May.....	133 33	
			200 69
	Expenses paid by J. H. Logan at Clinton.....		31 25
			1,329 41
	DR.		
1890	Membership fees.....	\$29 00	
	State Auditor.....	1,250 00	
	Balance credited treasurer's account.....		50 41
			\$1,329 41

We, the Finance committee, having examined the account of the Treasurer, find it correct.

S. W. GILBERT,

C. C. BELL,

N. F. MURRAY,

Committee.

REPORT OF COMMITTEE ON OBITUARIES.

Your Committee on Obituaries are deeply moved by the fact that within the year we have had to part by the fiat of our Heavenly Father with two brethren, who were ever active and earnest workers in the Missouri State Horticultural society—namely, D. S. Holman, late Treasurer of our Association, and Charles Patterson—both ever intent to do with their might what their hands found to do. We humbly bow to the will of Him with whom we have to do.

Again and again we are admonished that in "the midst of life we are in death;" and the fact is still true that all men think all men mortal but themselves. And yet this is only a half truth, because men will still put their house in order on devise of earthly possessions which have been lent unto them with the admonition, "occupy till I come."

It is not given to many men to die like Secretary Windom or Judge Breckenridge, and others as faithful though not so prominent in the Nation, literally with the harness on. But the summons came to our brethren, D. S. Holman and Charles Patterson, in such a manner that neither of them lingered long in waiting. They also went home "like shocks of corn fully ripe, and fit for the Master's use."

Certainly they are sadly missed and sincerely mourned in their homes. Not only there, but in the active walks of life they are missed; yes, this Society misses them because they were almost always present at our meetings, and if present, then active, devoted and earnest workers, because by nature and habit they were horticulturists *con amore*.

There is no cause of mourning; rather let us notice their demise with becoming reverence, humility and submission, yet rejoicing that they have gone home to join the ransomed host of their and our Lord, and let us so live, as imitating their example and leaning upon the same support, strengthened by their hope and faith, until we, too, join the great majority on the other side of Jordan.

Our brother, D. S. Holman, was not only a sincere and devoted Christian, but an ordained minister of the everlasting gospel of peace and good will, faithful in every good word and work. He was sick nigh unto death while this Society was in annual session at Clinton last winter. We indulged and trusted in his recovery, and so strong was this hope that we elected him as our Treasurer to be his own successor. "Man proposes; God disposes." "Even so, Lord, for so it seemeth good in Thy sight." We know that we cannot write much of personal character of Brother Holman, for we consider the family relation too sacred for us to intrude.

Charles Patterson was an adopted citizen of the United States and of Missouri. He was a mechanic, but adopted horticulture late in life as being more in accord with his tastes, more conducive to health, and as affording large opportunity to do good to his fellow-man. He was thoroughly unselfish, ready to work in any place in our Society to which he might be appointed, and he was conscientious in the discharge of every duty, even as a Christian gentleman in the best acceptation of the words used. No doubt, the Master of Assemblies has pronounced the "well done." Let us imitate his example.

Your committee beg leave to suggest that a copy of these obituary notices be engrossed, signed by the President and Secretary of this Society, and conveyed to the family of each of our deceased brethren.

J. H. LOGAN,

CHAS. W. MURTFELDT.

REPORTS OF LOCAL SOCIETIES.

N. F. Murray, of Holt county, reported a less number of meetings lately, but societies are doing grand work, and all feel that the work is growing: two canning societies already established as the result of active work of the horticulturists; prospects good.

Judge Miller suggested that the local societies be asked to begin to work for the World's Fair.

ATCHISON COUNTY HORTICULTURAL SOCIETY.

To the Missouri State Horticultural Society :

This county being in the northwest corner of the State, and of the "Platte purchase," was one of the last in the State to be occupied, although it was by nature one of the richest counties in the State. People moving from the North and East would not settle in a slave State, and well-to-do people from the South would not go where their chattels could elope in a night to either of the free states of Iowa or Nebraska. When I moved here in 1868, three years after the close of the war, three-fourths of the county was reposing in a state of nature. The finest meadows and pastures in America were going to waste, except for the annual deposit of ashes left to enrich the future husbandman. A few orchards of haphazard varieties had been planted by the early settlers around the timber; a severe frost had killed off about half of the apple trees, and the general belief was that this is not a fruit country. I paid \$1.75 per bushel for the first apples we used, and I had to pay at least \$1 for all we needed until we had them off our own trees.

Even as late as ten years ago, very few apples were shipped from our county—perhaps five or six car-loads. Now I can report for the year 1890, that Atchison county has shipped 246 car-loads and 3,800 barrels in small lots, besides a large quantity carried in wagons to Iowa and Nebraska, making in all not less than 260 car-loads—worth over \$100,000.

Our county is said to be the second best in the State (perhaps in the West) in the amount of its shipments of fat cattle and hogs. It may yet become one of the foremost, also, in its shipments of apples. When all the young orchards on the east and north of the county produce as they do in the older parts, the apple product will be immense, and will be next to the corn crop in importance. I believe not less than 20,000 apple trees have been planted in our county this spring, and most of these have been selected with better judgment as to sorts than that of any former year.

The general prospect for fruit is good. Strawberries will be abundant. Raspberries and blackberries are set for too large a crop.

Every Morello cherry of all sizes is full. The plum crop will be lighter than that of last year.

Contrary to expectations, we will probably have a half crop of peaches on the few trees or sprouts from old trees left us after the few hard winters that are past. I may say that scarcely any peach-trees have been planted for the last five years.

The apple crop will not equal that of last year, especially in the leading winter sorts. The late frosts in the middle of May killed the most of the stand on the Winesap and Ben. Davis trees. Jonathan, Missouri Pippin, Grimes' Golden, Spy and others are very full.

The high prices of the past year, the formation of our County Horticultural society, and the agitation of the subject, have caused many to give more attention to their orchards in the way of better pruning, cultivating, manuring, etc., and a few have turned their attention to sprinkling the trees with poison to kill the moth.

In the matter of ornamental horticulture, our people are making rapid progress. It is getting to be the fashion to try to have things look well. The old dooryard, where the pigs used to cultivate the cottonwood and box-elders, is giving place to the smooth, velvety lawn, decked with arbor vitæ, spruce and fir. Geraniums are taking the place of jimson, and the snow-ball and Wiegella have supplanted the wild hemp and sunflower.

Our County Horticultural society comprises about forty members, four of whom are here as delegates from the County society.

Respectfully,

R. LYNN,

Sec'y Atchison Co. Hort. Society.

REPORTS FROM SOCIETIES.

W. H. Wheeler, of Lamonte, made a very favorable report of Pettis county society, and urged the members to meet with them in December.

Mr. Turner, of Meadville, made a report for Linn county.

Henry Speer, of Butler, made a report for Bates county.

F. McConn, of St. Joseph, made a report for Buchanan county. Their society had sixty members, and were not only growing fruits, but selling them.

Frank Holsinger reported for the Missouri Valley society that it was doing a good work as usual.

Mrs. Shultz, of Mound City, made a report for their society.

REPORT OF FULTON COUNTY (ARK.) HORTICULTURAL SOCIETY.

State Horticultural Society of Missouri, at St. Joseph, greeting:

One Mr. S. W. Gilbert, of Missouri, at Thayer, is hereby appointed and authorized to represent our society in your general assembly in June this year. We are fairly organized and equipped as a local organization. We have much interest enlisted, twenty to thirty members enrolled, and growing. We have a picnic now on hand, under the special management of the society. Good addresses are secured and several essays to be read, all pertinent to the subject of fruit-growing. We are just across the line, but belong as a child and offspring to Missouri and its grand organization, the Horticultural society of that State.

We are truly and respectfully,

FULTON CO. (ARK.) HORT. SOCIETY.

D. S. HELVERN, Pres't.

H. M. TUNSTALL, Sec'y.

HORTICULTURAL PICNIC.

The picnic of the Fulton County Horticultural society will be held at Mammoth Spring, June 6, on the picnic ground of last year.

The program as far as completed is as follows Other features and exercises may be added before the time arrives.

The hour of assembling is placed at 10 o'clock a. m., commencing with an address of welcome by Mayor Hutchinson.

Invocation and prayer by Rev. Troy.

Address by Chas. D. James—"Our Country, Our Location; its Fertility and Adaptability for Fruit-raising."

Music.

"Location for Orchards," H. M. Tunstall.

"Best Kinds of Fruits to Raise," T. B. Bryan.

"All about Grape Culture," J. H. Gentry.

"Berry-raising," F. P. Shelby.

"Stone Fruits—the Peach, Plum, Apricot," etc., S. W. Gilbert.

Music.

"Floriculture, Beautiful Flowers," C. T. Arnett.

Dinner and lunch.

AFTERNOON.

"The Demand upon the Horticulturist," L. D. Horton.

"The Resources of Arkansas," H. W. Zentz.

"How to Grow Trees," Mr. Lozler.

"How to Pick, Pack and Ship Fruits," D. S. Helvern.

"Injurious Insects," J. W. Simpson.

"What I Know about Fruit-growing in California and Arkansas," E. F. Brock.

Good music has been secured for the day. Preparation of the ground will be looked after. The invitation is extended to all who are interested in fruit culture to be present, and all who can come with family, children and friends, and enjoy the day. Do not forget to bring along a well-filled basket.

No further time being had, Mr. Murray read a paper as follows :

RELATIONS OF HORTICULTURE TO NATURE.

When we speak of horticulture, we refer to the process by which we arrange, classify and cultivate that which we find in nature. Nature is that we observe going on around us in the natural world, in what seems to be a uniform manner, seeming to be governed by certain fixed laws that will admit of development and improvement in that they govern. Nature then is not complete in herself; she is an unfinished creature, and horticulture begins where creation stops. Eden herself was imperfect without horticulture, for man was commanded to keep and dress the garden.

Horticulture then is to supply that which may be lacking, to set in order that which may be imperfect, to stand between cause and effect, that she may call forth those undeveloped and hidden powers of nature that may, by the touch of Horticulture's magic hand, spring into a new life, a new beauty, refining, purifying, elevating itself into grander fields of usefulness, more charming, more beautiful, until at last the desert blossoms as the rose and the solitary place becomes glad, and the solitary heart may safely say, I will now rest under my own vine and Ben Davis apple-tree. Happy is the man that is in such a state. His neighbors will praise him because he is doing well for himself, and his children will rise up and bless him when he is dead. But all men are not successful in horticulture. If there is failure, there is a reason for it. Our failures come either from neglect or from not understanding the principles of nature, either in ourselves or inanimate nature. It is just as necessary for me to understand the elements of my nature as to understand the properties of the soil and the laws that govern inanimate nature. If I am to be successful, I should study to know the elements of my nature and how to apply them. Man himself is a part of nature, and horticulture is a part of the plan of nature.

This is evident from what we observe going on around us in certain fields of nature beyond the reach of man, where provision seems to have been made for any lack, so that they may be complete in themselves.

Here then we might enter, and learn lessons from how other parts of nature are cultivated that would be useful to us in the cultivation of that part or field left to ourselves; for by this or in this way we learn our relation to things in nature, and the laws that govern them, and how to apply the elements of our nature to the things of nature; this is horticulture.

Many of the grand improvements that bless the present age might have been enjoyed a thousand years ago if man had entered and studied this field more carefully. It only requires common sense to do this. They were made to be understood by man: that is, certain things in them and about them may be understood for our benefit. But to know all about the laws of nature would be to assume too much, for this would put an end to all improvement. I enter this field only as a student. I may enter only as the slave serves his master. Let any one enter as the careful student, and he will soon be surprised at results.

The laws of nature are not written in books. They are written in the soil, in the air, the water, the frost, in the tree, its roots, its trunk, its branches, its buds, its leaves, its bark, its fruit, in the climate and nature of man.

I love my trees. (I pity the horticulturist who does not.) I would not plant a tree if I could not love it. If I love it, I love to study its nature to learn its wants, sorrows, its sickness, to know its enemies and destroy them; to know when it is tired or hungry, that I may minister to its wants.

Some of my trees are beautiful, some are homely, some are proud, some are humble, some are modest, even blush when I speak to them. We read of the language of the flowers: there is a language of the trees. Do I understand that language, and can I converse with them? Can I understand when they speak of their woes, their sorrows, and very often cruel treatment, and thus enlist my sympathies for their welfare? If so, I am beginning to understand the relation of horticulture to nature.

S. H. MURRAY,
Elm Grove.

AFTERNOON SESSION.

THURSDAY, June 4, 2 P. M.

GARDENING.

In all things that pertain to horticulture, there are two things that should be constantly kept in mind: one is utility, the other is the ornamental.

The first thing that pertains to gardening is the location of the ground for the purpose. The slope of the ground should be considered, whether east or west or north or south, and its proximity to the house. If the plat is too far from the house, the garden will not be visited as often as it should be by our wives, sisters and mother. The garden can be near the house and made ornamental to the house.

For convenience in cultivation, a long strip of ground will possess advantages not possessed by a square plat, as the former will admit of horse culture to much better advantage.

The time of planting the ground should claim some attention, for if planted very early it will be a long time before the seeds will germinate and come up, and you will have a fearful fight with weeds if you do not give up the struggle as a fruitless effort.

Again, you may have rains that may compact the ground so that your plants cannot push themselves through it, and your labor will be thus in vain. If, however, favorable conditions follow your early planting, you may, and doubtless will, secure vegetables some earlier than your neighbors.

I remember, in 1857, in Illinois, of planting some potatoes quite early in the spring, and some four weeks after planted some more of the same variety, and had potatoes first from the last planting.

Another difficulty often is met with by the early planter, and that is, Mr. Jack Frost comes and nips his early vegetables and blights his fair prospects, and pushes off the time when some appetizing meal can be obtained from the garden.

Gathering wisdom from past experience stretching over many years, I would not be in too much haste to plant the garden. When the ground becomes warm and in proper condition, seeds should be planted (and the seed soon makes its appearance above ground); the plants will be more stocky, and present such a dark green as to indicate vegetable health, and as a rule will be more satisfactory than too early planting.

In regard to vegetables to be planted and how attended, and the tools to be used, will be passed over for others who may have had better advantages and can bring the wisdom of experience to guide us in this important part of home life.

The garden brings to our minds a garden where no thistles and briars grew until man had brought upon himself and posterity the curse that by the sweat of

our brows we should eat our bread. Under the present order of things this curse has been turned to be the greatest blessing that could have fallen to the lot of man. The briars and thistles, and disappointments of life, even in gardening, are calculated under the direction of the wise Ruler of the universe to fit us for the garden of God in heaven.

STEPHEN BLANCHARD,
Oregon, Mo.

TWENTY-FIVE YEARS' EXPERIENCE WITH AN APPLE ORCHARD.

I do not give this to teach any one. I merely give an outline of my treatment and profit of this orchard, so that the reader may avoid my mistakes and blunders and judge for himself whether this was a success or failure.

In 1886, I set 500 four-year-old trees; every tree lived. As it was a very dry spring, I mulched them with some old straw, put some soil on it to hold it to the ground to hold the moisture.

I washed these trees once or twice a year for seven or eight years with ashes and water. This gives the bark a healthful natural green, while the grease in soap turns the bark red. Trees don't want any grease. I wash my young trees with sulphur, tobacco, ashes and a little soft soap to make it spread and adhere to the trees better.

No borers in my young trees. I believe a young tree needs washing as well as our children.

Until this orchard was 17 or 18 years old, there was no orchard in this neighborhood that had a better quality or higher colored apples than this orchard, nor none that paid better in dollars and cents, as I always sold above the market price.

In the fall I tie corn-stalks around them to protect them from rabbits. This I should do if there were no rabbits; it is a protection to the trees in the cold winter, and they will grow right off in the spring.

I use water in setting trees. I went to every tree ten or twelve times a year to see if they were all right; it seemed like it did them good to look at them.

Often the first four or five years I thought the tent caterpillar would eat them up in spite of all I could do. I have not seen any of this kind of caterpillar in twelve or fifteen years. There is another kind working on trees of all kinds for a few years; not at all the same that worked twenty years ago. At that time the canker-worm was very destructive to trees. There seem to be none now.

It appears that these insect pests have their time of destruction, and then disappear and be no more for a time. I have a young orchard eight years old, and have not seen one of these former caterpillars on the trees; the last two years a few of the latter; they are not near so destructive as the former. This orchard fruited very young. After I had sold hundreds of dollars' worth of apples, several of my neighbors asked me how it was that I had so many apples and that they had not enough for their own family use.

They set the same kind of trees, same age, bought from the same man, and set the same time and in the same kind of land. Why was this? Was it because I always pruned in June?

I am not satisfied with June pruning every year. Will it not injure a tree by pruning too much in June?

I trim my young orchard more in the dormant state.

I aim to trim my young orchard so as to throw the fruit as close to the strength of the tree as possible, and not cut any limbs from the body or the main head limbs after the tree gets to fruiting. This is rather a science job, and I do not know

whether my eye has mechanism enough to accomplish this or not. At least I shall try, as I see the awful blunders I made with my old orchard by leaving too many limbs in the start; then had to cut them away when the trees got to fruiting, which is injurious to the tree.

I cultivated it in corn, wheat and oats. When I sow small grain in my young orchard, I plant corn in the tree row and cultivate it. The corn cools the heat that rises from the stubble. After the orchard was six or seven years old I sowed it in clover. It remained in clover ten or twelve years in the midst of those three or four cold winters and three or four dry and hot summers.

I commenced cultivating this orchard at the same time there was a blight among our trees, which has disappeared. The trees commenced dying; some died outright; others had large limbs; I cut them out; next year there would be more dead limbs, and sometimes I could not see any cause whatever.

I plowed this orchard in June several times. I plowed it in June last with the turning plow. I plowed in June to destroy the blue-grass and timothy.

What caused this dying? Was it from the severe cold winters and hot, dry summers, or from too much June pruning, or from June plowing or blight, or all combined? It may be that I overdid the plowing, as I plowed this orchard twice a year for six or seven years, and always leveled the ground by putting crab-apple brush in a 3-by-6 scantling, 10 feet long, putting my weight on this, and leveled and pulverized the ground well, for I was determined to satisfy myself about cultivating an old orchard. I always took a hoe and leveled around the trees where the plow left it uneven, as I always plow around the whole field the same as if the trees were not there. In our rolling lands it does not do to throw the land to or from the trees in the lands. Before we plow again the furrows will wash out so we can never get it back, and our trees will set on a ridge and the water will run away from them.

My Jennetings, Westfields and Seek-no-furtherers have not fruited worth picking since I cultivated them, while the Jennetings in blue-grass sod that were set in 1861 have fruited much more and much better and larger apples.

I have not plowed this old orchard since June, 1890. The trees look well, and so far no signs of any dying limbs and a prospect for a good crop. The Jennetings, Westfields and Seek-no-furtherers are very full.

I manured some of my trees with well-rotted manure, spread well under the trees and between the trees, and not close to the trees, and plowed it under. Some of those trees have died outright; others have much more dead wood on them than those I did not manure, especially the Winesap, and the apples were not near so large as those that had no manure. This may not look right to some of you, but it is even so, and why is it?

Nearly every year the farm work would come on and the orchard had to give way, for all it paid better than any crop on the place.

My neglecting to prune at the proper time caused large limbs to be cut, and too much pruning at a time caused a great many water sprouts, which made the top thicker than before it was pruned.

Cutting large limbs I think is injurious to the trees, especially after the tree gets to fruiting.

While this orchard paid so well in fruit, I mowed many tons of good hay. I believe clover should be cut while in bloom and let lay for a mulch. Will clover be a benefit to an orchard provided it is cut in bloom and let lay for a mulch?

Why don't the codling moths bother seedling apples?

Why would not lime be a good wash for trees—young and old—by scraping the rough bark of the old trees? Would it not destroy the insects that harbor under the bark?

What is the matter with a tree where it bleeds from pruning? I have seen trees all black by bleeding from pruning. I believe a healthy tree will not bleed from pruning.

WM. BRODBECK.

NIGHT SESSION.

THURSDAY, JUNE 4, 8 p. m.

PROGRAM.

Song—Mrs. E. C. Owen.

Portrait painting—C. H. Kassebaum.

Report by Herman Yaeger.

Song by F. Neudorff.

Recitation—Miss Emma Evans.

Report of H. Claggett.

Song—Mrs. W. H. Heacock.

Report by A. J. Blake.

Recitation—Miss Minnie Murray.

The uses of the Beautiful in Horticulture, five-minute speeches.

Resolutions.

Song—Misses Rosa Knold, Maggie Knold and Lizzie Garish.

The last evening's session of the Horticultural Society—the closing meeting—was the liveliest and best session of the entire series of meetings.

At its close the delegates and members felt that this semi-annual meeting had been a perfect success. The audience too, was the largest of any of the sessions.

The program opened with a song by Mrs. Owens, followed by an exhibition of rapid crayon drawing by Mr. Kassebaum, a sketch of Blarney castle being made upon a large easel in a few seconds. A report from Herman Yaeger upon some important experiments was read.

After a well-rendered song by Fred. Neudorff, Miss Emma Evans recited a beautiful poem. A short letter from H. Claggett, a member of the Society, whose age is 85 years, was read. A song by Miss Minnie Murray, entitled "The Bridal Feast," and a song by Mrs. Heacock followed.

A laughable sketch on Italy, by W. M. Bumbarger, was read by the Assistant Secretary. The article was originally published in the Nevada Democrat, and its reading last night created a great deal of merriment.

J. T. Mider, of Wathena, Kan., made a brief but happy talk, and two short addresses followed, and then Mrs. Laughlin and Messrs.

Smith, Neilson and Miller spoke briefly on the theme, "The Uses of the Beautiful in Horticulture." The program then closed with a song by two ladies, "God be with you till we meet again."

The strawberries and other fruit on exhibition was sent to the Home of the Friendless, a resolution to that effect having been adopted.

Before closing, the President, in behalf of the Society, thanked the people of St. Joseph and the St. Joseph Horticultural society for kind treatment. The "Daily Herald" was also thanked for the full and complete reports published.

The closing resolutions are here given :

Resolved, That we heartily thank such railroads as have given us reduced rates, and especially the Missouri Pacific for long-continued courtesies extended so often to workers in our good cause.

Resolved, That we thank the St. Joseph Horticultural society for providing such elegant accommodations for our meeting; the city officials and citizens of St. Joseph for their kind reception and co-operation, particularly Mr. H. Neilson in the line of decoration, and the young ladies for their appropriate evening performances.

Resolved, That we express our grateful appreciation of the faithful and untiring services of the President, Vice-President and Secretary of the Association, for their services during the year, especially Secretary Goodman for the careful labor bestowed on his annual report.

Resolved, That we regard with pleasure the rapid increase in the use of fruits by all the people throughout the entire year as promoting not so much financial and industrial interests, as in that it is an important agency in promoting a normal physiological condition of the people, and is an aid in temperance reform, reducing the abnormal craving for alcohol and other stimulants.

NEOSHO, Mo., May 23, 1891.

L. A. GOODMAN, Esq.:

DEAR SIR—Please find annexed a few remarks that you may wish to use at your St. Joseph meeting.

I am here on a standing jury and find no time for more. Otherwise, a good deal might be said concerning the change that this complete success of copper remedies must and will make in our future planting.

This spring already, I have set out many kinds of grapes of fine quality, that for the last fifteen years I had utterly condemned, because I found it useless to try to obtain satisfactory results in a region as badly infested with black-rot as this is.

Respectfully yours,

HERMAN JAEGER.

NEOSHO, Mo., May 28, 1891.

L. A. GOODMAN, Esq., Westport, Mo.:

DEAR SIR—The two greatest enemies to successful viticulture are defeated. Both black-rot and mildew are under our control, and if we continue to have our grape crops ruined by these pests it is our own fault. This is positive language, but after having experimented during four years with copper remedies, I feel entirely justified in using it.

During 1888, 1889 and 1890, I experimented as agent of the Department of Agriculture at Washington, and according to the department's instructions. The results obtained here and at the other experimental vineyards in 1888 and 1889 are published, and can be got by whoever is interested in them.

The last season (1890) I made thirteen different experiments for the department. It is useless to give them here in detail. For all practical purposes it will suffice to say that Bordeaux mixture and the ammoniacal solution of sulphate of copper have proved to be the most effective and most practical preventives of both black-rot and mildew on grape-vines.

Wherever these two preparations, or either of them, were applied early enough and often enough, the success was complete on every variety of grapes. It was impossible to find a rotten grape on well-sprayed vines, while Concords, for example, left unsprayed in their immediate vicinity, lost 50 to 75 per cent of their fruit by rot. Unsprayed Delawares and Elvirs lost nearly all their foliage through mildew before September. Sprayed ones did not lose a leaf before heavy frosts stopped vegetation.

I shall not take up your time by describing the way to prepare and apply these remedies. Thanks to the useful services of our national Department of Agriculture, they are easily obtained by everybody. It is sufficient to state that using the ammoniacal solution of carbonate of copper instead of Bordeaux mixture for the last spraying (or for all our sprayings) will obviate the only serious objection to the use of Bordeaux mixture, viz. : staining or soiling of the fruit.

While Bordeaux mixture is generally prepared by using 6 pounds of sulphate of copper to 22 gallons of the liquid, and while my experiments for the department were made with mixture of that strength, I have on a large part of my vineyards, not used as an experimental station, applied a spray made with two pounds of sulphate of copper only to 22 gallons of mixture, and on still another portion of the same vineyard I used even a still weaker solution of but 1 pound of sulphate of copper per 22 gallons. Both of these mixtures proved quite as efficient as the usual 6-pound solution.

Very respectfully yours,

HERMAN JAEGER.

RICH HILL, Mo., May 28, 1891.

Mr. President and Gentlemen of the Missouri State Horticultural Society :

Allow me to congratulate you on your coming together in the interest of horticulture. Having been a member of the Society from its first organization, and an active worker for a number of years, I presume there will be at least a few in your assembly who will remember my presence as the presiding officer of the meeting that was held over twenty years ago in the city where you are now assembled. Up to that time I believe I had never failed to attend a meeting of the Society, but time brings changes. Nearly fifteen years ago, having reached the age of three score and ten, my children being grown, I retired from business responsibilities. I little thought then of continuing here in the enjoyment of good health as I now am and have been. Since that time I have made my home most of the time among my children, but did not lose my love of progress in horticulture, and generally took charge of some of the finer fruits and vegetables of the garden, which afforded me needed healthful exercise, and at the same time enjoyed experimenting and comparing results of different methods of cultivating and pruning, and the progress made thereby.

Since the organization of our Society we have seen great progress in the art and science of horticulture, and there is still room for progress. I would be glad

to be with you at your meeting, and participate with you in your deliberations; but as I cannot, allow me to present a few thoughts and suggestions on a branch of the subject on which I have had considerable experience and pleasure in results obtained.

In the early days of our Society, grape culture and wine-making were among the most prominent subjects that engaged our attention. Large numbers, most of them with little or no experience, embarked in the business; but much the larger portion of them have abandoned the business for wine-making. Still a large number have a few vines for fruit, and no one that has a garden should be without them, and but few would be if they knew how to prune and train them to attain the best results.

Having had over thirty years' experience in the management of the vine, I have reached a method of pruning and training that yields results both in quality and quantity of fruit far in advance of the ordinary results obtained, and yet simple and easily put in exact practice. The following is a brief outline of my method:

The vines should be set eight feet apart in the rows and the rows eight feet apart. The first year only a single cane should be allowed to grow from each vine, and trained to stakes three or four feet high. The second year a trellis should be put up, with posts set sixteen feet apart and standing five or five and a half feet above the ground. The posts at each end of the rows should be set four feet outside the vines. On these posts stretch three wires—the first two feet above the ground, the second fifteen inches higher, and the third at the top of the posts. Cut the canes down to two buds, from which raise two canes for next year's bearing. These should be trained up to the top wire. Rub off the suckers as they appear up to the top wire, turn the canes in opposite directions on the top wire, and pinch them off near the meeting point of the cane from the other vine. The vines should not be allowed to pass each other. The suckers should be allowed to grow on the part of the vine on the top wire, a foot and a half or two feet long, where they may be again pinched off. These canes should be cut off in the winter or early spring at the top wire and trained in opposite directions, in a hoop-like form, over the middle wire and down to the first, and there tied. When the buds put out branches, the two lowest should be selected as canes for the next year's bearing, and trained to the top wire and treated as previously directed.

When the branches on the bearing canes have advanced beyond the last bloom, they should be pinched off at, or not more than one leaf beyond, the last bloom. The bloom begins to appear opposite the second or third leaf and one opposite each leaf, until the last bloom appears. When a leaf appears beyond a bloom, there will be no more bloom on that branch. That is a guide to pinch it off, and the sooner it is pinched off after it reaches that point the better. As the branches do not all appear at the same time, they should be gone over several times, until all have been pinched, and every branch that appears with three leaves without a bloom should be rubbed off.

"Every branch that beareth not fruit should be taken away, and every branch that beareth fruit should be pruned, that it may bring forth more fruit." As the suckers in the axil of the leaves grow, those opposite the blooms should be pinched off, leaving one leaf, which will leave two leaves to feed each bunch of grapes; where there are no blooms they should be rubbed off entirely.

This pinching back is a very important part of the work, and should not be neglected. A boy or girl ten years old can readily be instructed to do the work, as the work is light, and every point so definitely stated as to be easily apprehended. For the next year the canes that have borne a crop should each be cut down to one

bud, to raise two canes for the next year's bearing, and the two canes raised the previous year should be cut off at the top wire, and both sets trained and pruned as directed for the preceding year—the same process to be continued year after year. Thus it will be seen that the canes never bear but one crop, laying the foundation the first year and completing the crop the next. The fruit is always grown on the wood of the previous year's growth.

The number and size of the blooms that will come on a branch is fixed in the bud before the leaves are shed, hence the importance of raising special canes each year for the next year's bearing, and that they should have the best conditions afforded them to do their work, and that the forces of the vine should be turned to where the proper work is to be done, and not wasted in producing an excess of foliage, to rob the leaves that are doing the proper work of the fresh air and light needed to perform these proper functions. Those who have bearing vines and are disposed to adopt this method can do so next year by selecting the best bearing wood they have, and training to the best advantage on the first and second wires, or as near this plan as their trellis will permit, and raise special canes for next year's bearing. This will increase the size of the grapes, by doing the proper pinching, but will not increase the number and size of the bunches to the branch until the next year, from the properly treated canes. I usually get from three to four large compact bunches to each branch of the large varieties of grapes—more than double the weight of the average bunches—and often from five to seven compact bunches from the smaller varieties. I would suggest to those who doubt the value of this method to try it on a portion of their vines for the next two years and hold fast to that which is good, and brings to them the greatest reward for their labor. But some will say they have not time. If fifty vines, properly attended, will yield more and better fruit than a hundred half attended, leave out fifty and bestow the whole attention on the remainder.

Hoping you will have a pleasant and profitable meeting, I remain,

Yours truly,

H. CLAGETT,

Rich Hill, Mo..

WINTER MEETING AT SEDALIA

THIRTY-FOURTH ANNUAL MEETING,

HELD IN SEDALIA, DEC. 1, 2, 3, 1891.

Tuesday was spent in arranging the fruits and flowers. The two court-rooms were at the disposal of the Society. One was filled with tables, and over 500 plates of fruit were on the tables. The other was beautifully decorated with plants and cut flowers, and one of the pleasantest sessions of the Society was held there.

The following report by Colman's "Rural World" will give an outline of the work:

Tuesday, December 1st, the criminal court room of the Pettis county court-house was well filled by 7:30 p. m., when President J. C. Evans called the same to order. Prof. Gregg's orchestra rendered a choice selection, followed by an earnest and appropriate invocation by Rev. A. H. Stephens. Miss Helen Gallie's vocal selection called forth hearty applause. Acting Mayor Carroll made the address of welcome, which was responded to by President J. C. Evans. Upon the completion of these preliminaries, Dr. J. M. Allen, of Liberty, Mo., delivered his address upon the "Germ Theory of Disease" as applied to vegetation. His address received marked attention. The discussion was participated in by Prof. Duffy, of Shaw's garden, Judge Samuel Miller and others. After the appointment of the usual committees, the Society stood adjourned until 9:30 a. m., December 2d.

WEDNESDAY, 9:30 a. m.

Delegates and visitors found the circuit court room at this time well filled with long tables, on which over 500 plates of fruit had been placed. This display was but little less than that made at Clinton last year; the quality was regarded as better, and like nearly all past displays, showed a gradual improvement. The press was represented by the local papers, in which detailed reports were daily made, by the "Rural World," "Kansas Farmer," "Prairie Farmer," of Chicago, and "New York Tribune." Illinois sent W. S. Perrine, of Centralia, while Kansas sent about a score of its most enthusiastic workers.

PAPERS READ.

The first was by J. N. Menifee, of Oregon, Holt county, "How to Grow the Strawberry." The leading points were :

If season is hot or dry, plants must not be set in July or August.

Location—Select high land near dwelling and plant in long rows. Plow deep and harrow thoroughly. Plant for quantity, Crescent, Beder, Wood. For quality, Bubach No. 5, Beder, Wood, Warfield No. 2, and Gandy's Prize, in the order named.

How to plant—In rows three and a half feet apart, fourteen inches in the row. Every seventh row a different variety, to aid in the more thorough fertilization. In hot, dry weather the plants should be covered for a day or two.

Cultivation—Shallow, thorough cultivation. Cover with coarse stable manure when cold weather approaches. Wood ashes should be used freely. In the spring remove mulch sufficiently to give all the plants a good show.

Picking—Have only careful pickers, choice boxes and honest measure.

Renewing—Plow up after second crop is picked.

DISCUSSION

Showed that many used the spade, while others still held to the gardener's trowel. S. W. Gilbert uses a tamper. Michel's Early does not succeed in Northwest Missouri. C. I. Robards thinks the Glendale a most excellent shipper, and several others confirmed the statement. Capt. Jack came in for a share of praise, especially from Capt. Smith, of Lawrence, Kansas. Illinois growers prefer coarse prairie grass for covering in winter, spreading carefully between the rows for spring. By this they avoid cultivation early in the season. Capt. Hollister thinks the Crescent not a profitable berry for the shipper. S. W. Gilbert had no trouble with it even in shipping long distances. The Hoffman seedling, the Glendale and Charleston were recommended for their shipping qualities.

PACKAGES.

The discussion on packages had not proceeded far before a "hot box" was found, and to cool the same, A. Nelson offered the following resolution :

Resolved, That this Society adopt a standard package for apples, peaches and small fruits.

Which motion prevailed. Committee appointed.

THE RASPBERRY.

W. C. Freeman, of Brookline Station, told how to grow the raspberry. A deep, rich alluvial loam the best. If this is not to be had, the ground must be enriched by well-rotted manure.

Location.—A northern slope preferred, deep plowing best.

Planting.—For Reds, set in fall or early spring in rows three to four feet apart, and cultivate thoroughly as long as weeds appear. Allow no fruit to set the first year. Cut back the canes to about one foot the first year. Tender varieties should be cut back near the ground. Remove all the old and dead wood. The nearer the ground the buds appear, the better.

Black Caps.—Set three to seven feet apart, treat much the same as the Red Caps. Setting in the fall preferred, but may be set in the spring, if great care is used. Cultivate and hoe first year as late as October. Crops between the rows a hindrance. Only thorough work will pay. Top the plants eight or ten inches high, and if a large number of canes is wanted, top the canes.

Pruning.—First year cut back to foot or eighteen inches, according to strength of plant. For weak plants cut back to ground. Top the young shoots twelve or fourteen inches high until laterals fill out the rows.

Picking.—Prepare in advance crates made and filled with boxes. Secure the pickers, one-third more than you will need, assign them to certain rows and see that they work only there.

DISEASES.

Rust.—Grub out and burn. Spraying as for grape-rot not recommended.

Root Disease of Red Caps.—Prof. Duffy thinks it is similar to the wood-louse or "woolly aphid" on the canes. It is a species of the bark-louse; recommends kerosene emulsion for the canes; a weak solution applied at time of hatching.

Formula for Emulsion.—Kerosene, two gallons 67 per cent; common or whale-oil soap, one-half pound; water, one gallon. Dissolve soap in boiling-hot water and add kerosene. Churn the mixture for ten minutes. This emulsion, if perfect, forms a cream which thickens upon cooling, and should adhere without oiliness to the surface of glass. Dilute before using. Use one part of the emulsion to fifteen parts of cold water.

AFTERNOON SESSION.

BLACKBERRY.

"How to Grow the Blackberry," by Jacob Faith, a very practical paper along the same lines heretofore stated in this report.

DISCUSSION.

The Minnewaska came in for high praise. Smith, of Lawrence, Kansas, spoke for Taylor's Prolific and Stone's Hardy.

Mr. N. F. Murray thinks the Snyder the leading berry in the Northwest, but the Taylor is coming into favor. Mr. Murray recommends for long-distance shipping that berries should be picked in the latter part of the day.

The Kittatinny is most profitable in some localities, while in other places it is being dug up.

Maj. Evans thinks Snyder and Taylor the two best varieties.

Location and altitude cause some kinds to succeed when others fail. Some use a 6-inch straw mulch in place of cultivation.

Mr. Oulp has best success with the Snyder when cut back two-thirds from the top down.

"How to Grow Currants, Gooseberries and Quinces," by Judge Samuel Miller. This paper was so condensed and eminently practical that one needs to read it complete. Our readers may expect it entire in some future issue.

"Fruits on a Dairy Farm," by G. B. Lamm, of Sedalia. In this he has successfully handled butter, cheese and milk in connection with the sale of fruit, and thinks it profitable when judiciously done, one often helping to sell the other. Successful help in one department makes successful help in the other.

"Sheep on a Fruit Farm," by L. T. Kirk, was a most excellent paper, showing how those lands too rough for fruit-growing could best be utilized by growing sheep. They require the least attention when the fruit requires the most, and *vice versa*. The sheep and the apple-tree have many points in common, viz., they both pay best when best cared for. Many other valuable points.

"Grape Culture in and about Gasconade county," by Jacob Rommel, in which he spoke of the success of the Bordeaux mixture in preventing the grape-rot. Used five applications from before blooming on for several weeks. Believes we should seek for hardy seedlings that are rot-proof.

On same subject, Herman Yaeger, of Neosho, sent up a paper in which he reiterated the statement made in his paper read at the Summer

meeting, that spraying with the Bordeaux mixture had proved entirely satisfactory. Has used the ammoniacal solution with the mixture. He is now growing more than fifty varieties that he had abandoned before the use of the mixture had been proven a success. Spoke very highly of four varieties now grown in Texas by Mr. Munson.

The discussion on this subject was exceedingly pleasant, and our Kansas neighbors asked to have their eminent viticulturist, John Burr, who has spent 67 years in investigating the grape culture, placed in the same rank as Prof. Newman and Herman Yaeger. This was seconded by Secretary Goodman, who spoke in the highest terms of praise. He stated that on the morrow this man would be 91 years of age. Later he offered a resolution making Mr. John Burr an honorary member of this Society, which was adopted unanimously.

It was recommended that the Bordeaux mixture be used in a diluted form while the bloom and leaves were young and tender.

The Committee on Standard Fruit and Berry Packages made this report: That we adopt for a standard apple barrel as provided in section 8858, Revised Statutes of Missouri, which provides that the length of the staves be $28\frac{1}{2}$ inches, with a chine of $\frac{1}{4}$ inch at the ends; the diameter of the ends to be $17\frac{1}{4}$ inches, and the diameter of the center of the barrel shall be $20\frac{1}{2}$ inches inside. It is understood that this is the regular flour-barrel size. That we adopt the six-basket crate for fancy peaches and the third-bushel box for medium and small peaches. That we use a full, dry-measure quart box for all small fruits except the Red Cap raspberries, which shall be a shallow pint box.

The standard size for Ben Davis and large apples shall be not less than $2\frac{1}{2}$ inches in diameter, and shall be free from worms, bruises and scabs.

For Winesaps, Genitings and other apples of this size, it shall be not less than $2\frac{1}{4}$ inches, and free from worms, bruises or scabs.

"Comparative Value of the Larger Fruits," by J. H. Monsees, Beaman, and "Fruits along the Missouri River," by J. T. Mider, Wathena, Kansas, were both by practical horticulturists, and full of every-day practical pointers, and closed the day's session.

Evening, December 2.

This was introduced by some most excellent music by the well-trained choir.

"The Strawberry Market—the Outlook for the Future." The speaker attacked the Crescent as unfit to ship, and one cause of the low prices owing to the unfit condition in which it arrives in the market. Hoped to see a less acreage, and these to be of a kind or kinds of a better shipping quality.

J. T. Mider, of Wathena, Kansas, and Capt. Hollister read papers—the latter bringing out the possibilities of Missouri as a horticultural State.

Mrs. Boller, of Sedalia, read a strong Prohibition paper under the name of "Harmless Drinks." This was a very good paper in its line, but disappointed the audience, as it had very little to say about harmless drinks.

Dr. Curry, of Christy, Mo., who ranks as the most eminent archæologist of the State, read a highly interesting paper on "Some Things Found in the Ground," or prehistoric matters. This had special reference to the Indian mounds in this and other States. Dr. Curry illustrated his lecture by drawings on canvas and tools and figures taken from these mounds. Dr. Curry has the good fortune of being able to read the hieroglyphics found in many places, and has the material already prepared for a book on these subjects. He was adopted into an Indian tribe when a small boy, and to him was confided much of historic character bearing upon the subject of mounds and mound-builders. It was a wonderful paper.

Prof. Edwin Walters, of Kansas City, discussed "Present Problems," or how can the social balance be restored to its equilibrium.

December 3.

The leading feature of the forenoon session to-day was a short address by N. H. Gentry, President of Missouri World's Fair Commission. He had just returned from a meeting of the commission at St. Joseph, and gave the fruit-growers to understand that their business should receive the proper recognition at the hands of the Commission.

Supt. Gwynn emphasized what the President had said, and more fully outlined the work expected of the horticulturists in Missouri.

Secretary Goodman spoke of the future work of the Society in preparing for the Columbian Exposition.

On motion, the Society asked the World's Fair Commission to place the horticultural exhibit of Missouri under the control of President J. C. Evans.

The election of officers took place at the afternoon session, and the old officers were elected, with A. Nelson as Treasurer. Secretary Goodman read his annual report, which, as usual, was replete with valuable suggestions.

THE SUMMER MEETING.

Invitations for the summer meeting were received from Pertle Springs and Lamar, and for the winter meeting from Chillicothe, Carthage and Lebanon. The matter was referred to the Executive Com-

mittee. Prof. Duffy, of Shaw's garden, made a most excellent talk on the use of the Bordeaux mixture for grape-rot, illustrating the same by enlarged photographs of the fruit treated and untreated. As he has promised to write out his talk in detail for the "Rural World," we omit any further comment. His article will be looked for with interest.

Mr. Luckhart, of Oregon, gave valuable testimony as to the value and success of spraying.

On motion, John Burr, of Kansas, and Miss M. E. Murtfeldt, Judge Samuel Miller, Herman Yaeger and Prof. M. G. Kern, of Missouri, were made life members of the Society by unanimous vote.

The by-laws were amended providing for a second Vice-President, and Judge Miller was unanimously elected to that office.

"Refrigerator Cars," by J. M. Rice, of Sarcoxie, was an interesting paper, but brought out an animated discussion, some of the shippers having widely different results from similar shipments.

Mr. Perrine of Illinois, and J. H. Logan, of Missouri, thought all shipments of twenty-four hours or less could be made safe in well-ventilated cars without the use of ice.

"A Plea for Shows," by Judge C. I. Robards, of Butler, was strictly along the line the title named.

EVENING, December 3.

The music by the juvenile orchestra and singing by a select choir put everyone in a happy mood for the closing session.

"Orcharding in North Missouri," by N. F. Murray, will appear in the "Rural World" in due time.

"The Mission of Flowers," by Mrs. G. E. Dugan, was highly appreciated by everyone.

"Progressive Entomology," by F. A. Sampson, of Sedalia, paid a high tribute to Prof. Riley.

"Summer Lessons," by E. A. Pollard, showed close observation, and was well worthy an older head.

Pres. J. C. Evans spoke of a noted peach-tree in Douglas county, and the Indian traditions connected with it.

The Committee on Final Resolutions made their report, in which was a very complimentary resolution to Prof. J. W. Clark upon his labors in horticulture since he came to Missouri, and expressing regret that he should consent to leave the State.

B.

The following is from the "The Kansas Farmer," and shows what our neighbors think of us:

MISSOURI HORTICULTURAL SOCIETY.

The thirty-fourth annual session of the Missouri State Horticultural society was held at the enterprising and beautiful little city of Sedalia, on December 1, 2 and 3, by invitation of the Pettis County society.

The forenoon and afternoon of the first day were occupied in arranging one of the finest displays of fruit ever shown in the great fruit-producing State of Missouri. Of apples there were over 200 varieties on exhibition, including several remarkably fine specimens of unknown seedlings. The floral display was large, the quality magnificent and the arrangement most beautiful.

The attendance was the largest in the history of this progressive Association, and the ability displayed and practical information imparted cannot be excelled within the great Mississippi valley.

President J. C. Evans is recognized as one of the ablest in the field of horticulture, makes a wise presiding officer, and is a most thorough, courteous gentleman. The same is truthfully said of Secretary L. A. Goodman. In fact, this Society has a fine set of officers throughout.

Following the opening exercises, in the evening, "The Germ Theory of Disease as Applied to Vegetation," was delivered by Dr. J. M. Allen, of Liberty, Missouri, and was in every respect an able paper and was listened to with the closest attention. Some new ideas were advanced by the doctor, and it was easy to be seen that his address had made a very marked impression on his audience. He is a splendid reasoner and handled the subject like a veteran.

The evening session was largely attended by the intelligent, appreciative citizens of the beautiful, enterprising, future capital city of Missouri—Sedalia. The musical exercises of the entire session were most magnificent and soul-stirring.

The most valuable papers read before this session of the Society were:

- "Wastes in Horticulture," by Prof. J. W. Clark, Columbia.
- "How to Grow the Strawberry," J. N. Menefee, Oregon, Mo.
- "How to Grow the Raspberry," W. C. Freeman, Brookline, Mo.
- "How to Grow the Blackberry," Jacob Faith, Montevallo, Mo.
- "How to Grow Currants, Gooseberries and Quinces," Samuel Miller, Bluffton, Mo.
- "Fruits on a Dairy Farm," G. B. Lamm, Sedalia.
- "Sheep on a Fruit Farm," L. T. Kirk, Sedalia.
- "How to Grow a Nursery," A. Ambrose, Nevada, Mo.
- "How to Grow a Vineyard," H. Yaeger, Neosho, Mo.

- "Comparative Value of the Larger Fruits," J. H. Monsees, Beaman, Mo.
 "Fruit Along the Missouri River," J. T. Mider, Wathena, Kas.
 "Stawberry Observations," B. F. Smith, Lawrence, Kas.
 "How to Grow an Apple Orchard in North Missouri," N. F. Murray, Oregon, Mo.
 "In South Missouri," A. Nelson, Lebanon, Mo.
 "A Plea for Shows," C. I. Robards, Butler, Mo.
 "Some Suggestions About the World's Fair," L. A. Goodman, Westport, Mo.
 "Commissioners and the Horticultural Exhibit," N. H. Gentry, Sedalia.
 "Horticultural Growth," Dan Carpenter, Barry, Mo.
 "Harmless Drinks," Mrs. Boller, Sedalia.
 "Something Found in the Ground," Dr. E. S. Curry, Christy, Mo.
 "Co-operative Shipping," F. McCoun, St. Joseph, Mo.
 "Insect Architecture," Miss M. E. Murtfeldt, Kirkwood, Mo.
 "Present Problems," Edwin Walters, Kansas City.
 "Business Our Aim, Success Our Object," Geo. Longman, editor "Rural World," St. Louis.
 "The Farmer's Flower Garden," Edward Brown, Sedalia.
 "The Farmer's Yard," H. T. Burris, Clinton, Mo.
 "Shaw's Garden," Prof. Wm. Trelease, St. Louis.
 "Refrigerator Cars," J. M. Rice, Sarcoxie, Mo.
 "How to Grow a Peach Orchard," W. G. Gano, Olden, Mo.
 "How to Grow a Pear Orchard in East Missouri," R. J. Bagby, New Haven, Missouri.
 "In West Missouri," Wm. Maxwell, St. Joseph, Mo.
 "How to Utilize Our Fruits," Wm. Brodbeck, Oregon, Mo.
 "Bugs," F. A. Sampson, Sedalia.
 "Injurious Fungi," F. Lionberger, Hugo, Mo.
 "How to Grow the Plum and Cherry," G. W. Hopkins, Springfield, Mo.
 "Trials of an Apple Packer," Henry Speer, Butler, Mo.
 "How to Make and Plant a Lawn," Prof. M. G. Kern, St. Louis.
 "The Mission of Flowers," Mrs. G. E. Dugan, Sedalia.
 "Birds," Prof. H. W. Specking, St. Louis.
 "Comparisons in Fruit-growing," Capt. E. T. Hollister, St. Louis.
 "Old Orchards," R. Lynn, Tarkio, Mo.
 "The Uses of the Beautiful," Ralph Smith, Laclede, Mo.
 "What Good do Horticultural Societies Accomplish?" Prof. G. L. Osborne, Warrensburg, Mo.

As we expect to publish most of these excellent papers during the year, we will attempt no quotations in this report.

One of the most important things accomplished during the session was the recommending of a standard dry measure, size of fruits, and standard packages. The recommendation is as follows:

Standard packages.—A standard apple barrel, as provided in section 8858, Revised Statutes of Missouri of 1889: Length of barrel, 28½ inches, with chimes of ¼ of an inch at the ends. The diameter of the heads, 17½ inches. Diameter of center of barrel inside, 20½ inches. (R. S. 1879, §7667.) This is the size used for flour barrels. Six-basket crates for fancy peaches, and the ½ bushel boxes for the medium. Full dry-measure quart boxes for all small fruits, except the red raspberry, which

shall be a shallow pint box. Standard apple size for the Ben Davis not less than 2½ inches in diameter, free of worms or scab. Size of standard apples: Winesap, Geneting and other apples of this size, not less than 2½ inches in diameter, free of worms, scabs and bruises.

The Committee on Transportation reported as follows:

WHEREAS, It is an undoubted fact that the shipments of fruits and vegetables are much greater in volume than the shipment of grain in the United States, and that their production is increasing so rapidly that the supply is annually forcing the prices down to a point at which it is becoming unprofitable, and will have to be abandoned unless the common carrier is made to realize the importance of this line of business, and to extend further facilities, accommodations and better rates; and

WHEREAS, The said products are in almost all cases loaded by the shipper and unloaded by the consignee and carried by the railroad companies at the risk of the owner, with a guarantee of payment of freight charges, entailing no loss upon the company in case of loss or damages in transit; and

WHEREAS, From the perishable nature of the goods it is necessary to unload and dispose of them as soon as possible after arrival, and from the style of packages they are easily and quickly unloaded, and do not detain the cars so long as is usual with the shipment of grain; therefore, be it

Resolved, That in view of these facts, it is the belief of the members of the Missouri State Horticultural society that the horticultural products of the country are justly entitled to the same classification and rates as grain; and we respectfully ask the managers of the railroads of the country to place our products in the same class as grain, and give us the same rate, feeling certain that the increased volume of business will amply compensate them for doing so.

Your committee would respectfully recommend that the Secretary be instructed to cause these preambles and resolutions to be printed, and a copy be sent to all general freight agents throughout the country, accompanied by a personal letter.

Officers elected for the ensuing term were: President, J. C. Evans, of Harlem; Vice-President, N. F. Murray, of Oregon; Secretary, L. A. Goodman, of Westport; Treasurer, A. Nelson, of Lebanon.

NOTES.

For strawberries, prepare the ground in the fall, and plant as early in the spring as frost will permit.

Less acreage and better cultivation should be the "watchword."

E. T. Hollister, commission merchant at St. Louis, claims that the Crescent seedling strawberry fails to give satisfaction after the second or third shipment. He knows of no locality where the Hoffman seedling does not succeed remarkably well.

A representative of one of the largest berry-box manufacturing establishments says that they only make seventeen different sizes of quarts, of which only two will hold a quart. He says that they study only to please their customers. Surely this is an eye-opener to the consumer, and should most emphatically receive his displeasure and earnest protest.

Blackberries gathered in the morning will not ship so far in good condition as those gathered in the afternoon, unless it should be a rainy day.

Taylor's Prolific is considered one of the best blackberries in Missouri.

There is no plantation complete without both the Snyder and Taylor blackberry.

The location and quality of soil makes a vast difference in the culture of berries on the same farm.

Mr. Mohler, of Warrensburg, Mo., last year picked nearly 5,000 quarts of blackberries from one-half acre.

A Missouri horticulturist gathered 224 bushels of Snyder blackberries from one acre.

In trimming the blackberry, cut off two-thirds of the top.

Maj. Holsinger, of Rosedale, Kan., is successful with the currant, both in shady and open ground.

The gooseberry is one of the most profitable berries, and will stand more abuse than any other. In gathering large quantities of them use buckskin gloves, scrape off berries—leaves and all—and then run them through a fanning mill.

The noted veteran grape-grower, Mr. John Burr, of Leavenworth, Kas., reached his ninety-first year of age on the last day of the session, December 3, 1891. Mr. Burr has spent sixty-seven years in investigating and experimenting in grape culture, and succeeded in producing at least three of our best varieties, viz., the Jewell, Ideal and Paragon. All his great results have been produced on a few feet of ground.

Plant the Red-cap raspberry in the apple orchard.

Dr. Curry, in his lecture, exhibited an ear of corn grown from seeds found in one of the Mound-builders' burial places. He said that a stalk grew from one of the seeds planted by him to a height of fifteen feet, was seven inches in circumference at the base, and was unlike any of the corn grown in the present day.

The following is the report made by the local papers on the meeting and its successful conclusion :

These three different reports are appended, because each has a particular part which they present in a satisfactory way.

At 7:30 o'clock this evening in the large criminal court-room at the court-house, the 34th annual meeting of the State Horticultural society will be called to order, and will continue in session till Thurs-

day night. This is an organization of which many people are in ignorance. It has tended, more than anything else could, to propagate the fruit-growing interests of the State, and place Missouri in the first rank among the fruit-growing states of the Union.

The State organization is now more than thirty-two years old. It was on the 5th of January, 1859, a few persons met in Jefferson City "for the purpose of advancing and directing the fruit-growing interests of Missouri and the West."

The meeting organized by calling Prof. G. C. Swallow to the chair, and the appointment of Mr. F. R. Elliott, afterward secretary of the American Pomological society, as secretary. The name "Missouri Fruit-growers' association" was adopted, and Mr. Colman was elected president; F. R. Elliott, recording secretary; George Hussmann, corresponding secretary, and John Garnett, treasurer. The vice-presidents were Dr. McPherson, Prof. G. C. Swallow, George M. Horner, Dr. McGuire, Eldridge Burden, William C. Price and John Dedrick.

The first annual meeting after the organization was held at Jefferson City on the 27th of December, 1859, and Mr. Colman was re-elected president. Each year a meeting has been held; the organization has steadily advanced and grown in numbers until now there are twenty-seven local societies in as many different counties in the State, with a large membership in the State organization.

The Society has made exhibits of fruit at various places, and accomplished much in this way by directing the attention of the people of other states to Missouri as a fruit State.

At the meeting of the American Pomological society, at Rochester in 1879, several medals were awarded it—one for the largest and best display of apples made by any society, another for the best display of grapes, and another for the best display of pears.

Again in 1883 it made an exhibit of fruits at a meeting of the same society, and also at the Grand Rapids meeting in 1885. In February, 1883, it showed 85 varieties of fine fruits at the meeting of the Mississippi Valley Horticultural society at New Orleans. In 1884 it took various premiums at the exposition in New Orleans—a gold medal and \$200 on 200 varieties of apples; a silver medal and \$100 on 100 varieties of apples; a silver medal and \$75 on fifty varieties of apples; two other silver medals and twenty smaller premiums. At the St. Louis fair, the St. Louis exposition and other places, it has made exhibits with similar results.

In 1882, the Society having an appropriation from the Legislature of \$2,500 for two years, decided to establish an experimental orchard

and garden at the Agricultural college grounds, for testing new fruits and vegetables; and the reports of the committee in charge of the work show valuable results.

The present officers of the State organization are :

President, J. C. Evans, of Harlem.

Vice-President, N. F. Murray, of Oregon.

Secretary, L. A. Goodman, of Westport.

Treasurer, A. Nelson, Lebanon.

About 150 delegates are expected to be in attendance at this meeting, and arrangements have been made by the Pettis county society to give them a cordial reception.

In the circuit court room many long tables have been arranged for the display of fruits from all over the State that will be exhibited there, The rooms will be decorated with all varieties of flowers grown in Pettis county.

It is desired by those having the arrangements in charge that all who have flowers, and wishing to lend them to assist in the display, will let it be known to-day as early as possible, as the decorations will be placed to-day, preparatory to the opening meeting this evening.

The Pettis county society was organized four years ago, and has a present membership of about twenty-five. The officers are G. B. Lamm president, and L. T. Kirk, secretary.

An interesting and instructive program has been arranged for this meeting, and besides representatives from all over the State, there will be present five from Kansas, one from Illinois, one from Indiana and two from the Iowa Experimental station. Mr. Norman J. Colman, editor of the "Rural World," of St. Louis, will also be here.

Mr. F. A. Sampson, who is in the possession of one of the most extensive and complete libraries in the city, has almost the entire proceedings of the agricultural society from the time of its inception, lacking only the proceedings of two meetings. For the 33d meeting proceedings he has compiled a little pamphlet containing much valuable matter relative to the organization.

The program for this evening is as follows, the music being under the direction of Prof. Gregg and Miss Helen Gallie:

Music.

Opening prayer, Rev. A. H. Stephens.

Music.

Welcome address, Mayor E. W. Stevens.

Response, President J. C. Evans.

Music.

"The Germ Theory of Diseases as Applied to Vegetation," Dr. J. M. Allen, of Liberty.

"Wastes in Horticulture," Prof. J. W. Clark, of Columbia.

The appointment of committees will follow prior to the adjournment for the evening.

At 7:45 o'clock last evening the 34th annual meeting of the State Horticultural Society of Missouri, was called to order in the criminal court-room at the court-house, by President J. C. Evans.

All day yesterday was occupied in arranging the exhibits of fruits in the circuit court-room. Truly, there are some splendid displays. Of apples there are at least 200 varieties. There are persimmons, dried apples, dried peaches, berries, etc., a splendid display of these latter being exhibited by the Olden Fruit Co., of Olden, Mo. The company also have specimens of "tomato figs," "peach leather" and other articles manufactured from fruits grown by them.

Pettis county is not behind in the representation. Mr. G. B. Lamm has three varieties of apples; George Shepherd one hundred, and J. H. Monsees, fifteen varieties.

In the large north room where the meetings are held, several large tables are covered with potted plants and flowers, including a beautiful collection of chrysanthemums.

About sixty delegates arrived yesterday and registered. They were assigned quarters at the various hotels.

A large audience was present at the opening meeting, the large court-room being almost completely filled with visitors, among whom were many ladies.

The President rapped with his gavel and announced a musical selection by Prof. Gregg's orchestra.

Rev. A. H. Stephens opened the meeting with prayer; a song by a chorus of fourteen voices, eight ladies and six gentlemen, was sung; then President Evans introduced Hon. Chas. Carroll, acting mayor of the city, who in a few short, appropriate words welcomed the delegates to the city.

Mr. Carroll tendered the visitors the freedom of the city, and requested them to help themselves to anything they could find to add to their comfort and assist in making their sojourn in our midst pleasant, and if anything were lacking, we would endeavor to procure it for them from the soil, for he had been led to believe that the soil of Missouri could be made productive, so rich was it, of almost all things that add to the comforts of life. Mr. Carroll concluded by proffering the peaceful surrender of the city to the visitors, and expressing the wish that they would carry home with them naught but the most pleasant impressions of their stay among us.

President Evans repounded to the mayor's address of welcome, and said he knew their meeting here would be a pleasant one. He an-

nounced that the regular program would then be taken up, and after the rendition of another musical selection by Prof. Gregg, Dr. J. M. Allen, of Liberty, read a very able paper on "The Germ Theory of Disease as Applied to Vegetation."

Discussion of the paper followed, taken part in by Prof. Duffy, of St. Louis, Judge Miller, of Iowa, Mr. Myers and others.

In the absence of Prof. J. W. Clark, of Columbia, a very able paper prepared by him was read by Secretary Goodman.

The following committees were then appointed by the Chair :

On Fruits—Messrs. Espenlaub, of Kansas, Perrine, of Illinois, and Robards, of Missouri.

On Flowers—Mr. S. Miller, Mrs. George E. Dugan and Mrs. A. Nelson.

On Finance—Messrs. A. Nelson, W. G. Gano and N. F. Murray.

On Obituary—Messrs. R. E. Bailey, D. A. Turner and Major Frank Holsinger, of Kansas.

On Final Resolutions—E. T. Hollister, Conrad Hartzel and R. H. Wheeler.

After the appointment of the committees an adjournment was taken until 9 o'clock this morning, when the following program will be carried out :

Prayer—Rev. R. D. Black.

"How to Grow the Strawberry," J. N. Menifee, Oregon.

"How to Grow the Raspberry," W. C. Freeman, Brookline.

"How to Grow the Blackberry," Jacob Faith, Montevallo.

"How to Grow Currants, Gooseberries and Quinces," Samuel Miller, Bluffton.

"Reports on Small Fruits," by the members.

"Fruits on a Dairy Farm," G. B. Lamm, Sedalia.

"Sheep on a Fruit Farm," L. T. Kirk, Sedalia.

AFTERNOON.

"How to Grow a Nursery," A. Ambrose, Nevada.

"How to Grow a Vineyard," H. Yaeger, Neosho.

"Comparative Value of the Larger Fruits," J. H. Monsees, Beaman.

"Fruit Along the Missouri River," J. T. Mider, Wathena, Kas.

"How to Grow an Apple Orchard in North Missouri," N. F. Murray, Oregon.

"In South Missouri," A. Nelson, Lebanon.

"A Plea for Shows," C. I. Robards, Butler.

"Some Suggestions About the World's Fair," L. A. Goodman, Westport.

"Commissioners and the Horticultural Exhibit," N. H. Gentry, President, Sedalia.

EVENING.

Music.

"Horticultural Growth," Dan Carpenter, Barry.

"Harmless Drinks," Mrs. Boller, Sedalia.

Music.

"Co-operative Shipping," F. McCoun, St. Joseph.

"Insect Architecture," Miss M. E. Murtfeldt, Kirkwood.
Music.

"Present Problems," Edwin Walters, Kansas City.

"Business Our Aim, Success Our Object," George Longman, editor Colman's
"Rural World," St. Louis.

NOTES.

J. H. Miller, of Fairmount, Iowa, is present with a half dozen specimens of apples.

President Evans and Secretary Goodman have their wives with them, as have also several other delegates.

J. C. Randall, of Hamburg, Iowa, is present at the meeting, and taking a deep interest in the handsome displays.

J. S. Soule, associate editor of the "Kansas Farmer," of Topeka—Senator Peffer's paper—is present to report the proceedings for his journal.

W. S. Perrine, of Centralia, Illinois, is present as a delegate from the Illinois State Horticultural society. The society meets at Olney, Illinois, next week.

G. F. Espenlaub, of Rosedale, Kansas, is here and worked hard yesterday in arranging the displays. Mr. Espenlaub says the Kansas State meeting takes place next week.

J. L. Turton, of Turton & Keith, of Mayview, Lafayette county, has a handsome display, consisting of thirty-four varieties of apples, which attracts much attention. Mr. Turton is connected with the Clinton nurseries.

In the discussion of Dr. Allen's paper, Major Holsinger, who understood the doctor to state he would at once kill all pear trees attacked with blight, arose and said: "You are a physician, are you not?" "Yes, sir," replied Dr. Allen. "Well, would you kill your patients to get them out of the way?" This was a stumper, and the doctor looked thoughtful a moment when he replied: "I would if it would save the balance of the community." His answer brought down the house.

Major Frank Holsinger, of Rosedale, near Kansas City, is another Kansan present. The Major is treasurer of the Kansas State Horticultural society, and is the owner of a 300-acre farm upon which he grows raspberries, blackberries, cherries, plums and apples. He was formerly a member of the Olden Fruit Co., of Olden, Missouri. "Messrs. Evans and Goodman have done much," said he, "to develop horticulture in Missouri. Prior to their being placed at the head of the organization its growth was very slow." Major Holsinger is an ardent Republican, but has a slight leaning to a "dry" condition of things.

B. F. Smith, of Leavenworth, Kansas, is one of the representatives of our sister State, who is in attendance at the meeting. Mr. Smith is known as "The Strawberry King." Last season he marketed 50,000 crates of strawberries and 2,000 bushels of pears. He has forty acres in berries and an equal number in pears. Eleven years ago he moved to Kansas from Missouri, where he made a business of fruit-growing several years. "I have seen strawberries sell at \$15 per crate," said Mr. Smith, "and I have seen them come down to fifty cents per crate." Mr. Smith has the distinction of being the first man to safely transmit by express a consignment of strawberries. It was about thirty years ago. He was then running as express messenger on the Illinois Central. A farmer down at Ullin station, twenty miles below Cairo, desired to send a friend in Chicago a sample-box of his fruit. Messenger Smith took charge of the consignment on his own responsibility and delivered it safely. To-day hundreds of thousands of crates are marketed in this manner annually.

The second day's session of the Missouri State Horticultural society was called to order by President J. C. Evans at a few minutes past 9 o'clock yesterday morning.

The session was opened with prayer by Rev. Mr. Marquis, of the Central Presbyterian church, then the reading of papers was begun. "How to Grow the Strawberry," by J. N. Menefee, of Oregon. A second was on "How to Grow the Raspberry," by W. C. Freeman, of Brookline.

That was as far as they got on the forenoon program. An interesting discussion ensued upon the reading of the papers, which finally resulted in a committee being appointed to decide upon a standard measure for the sale of berries. The committee consisted of Messrs. A. Nelson, E. T. Hollister, S. W. Gilbert, Henry Schnell, Major Hollinger and Mr. Bell.

Immediately after dinner the program was resumed. "How to Grow the Blackberry," a paper prepared by Jacob Faith, of Montevallo, was, in the author's absence, read by the Secretary. Papers on "How to Grow Currants, Gooseberries and Quinces," by Samuel Miller, of Bluffton; "Fruits on a Dairy Farm," by G. B. Lamm, of Sedalia, and "Sheep on a Fruit Farm," by L. T. Kirk, of Sedalia; "How to Grow a Vineyard," by H. Yaeger, of Neosho, and Jacob Rommel; "Comparative Value of the Large Fruits," by J. H. Monsees, of Beaman; "Fruit Along the Missouri River," by J. T. Mider, of Wathena, Kas. This gentleman had two excellent papers prepared on this topic. Lengthy discussions followed the reading of each paper, and the afternoon quickly passed.

A goodly number of visitors attended the afternoon session.

Prior to adjournment for supper, President Evans appointed the following committee on railroad transportation: Captain E. T. Hollister, N. F. Murray, C. I. Robards and B. F. Smith.

Much interest was manifested in the beautiful display of fruits, and the room was thronged with ladies and gentlemen visitors all afternoon discussing the different varieties.

EVENING SESSION.

Shortly before 8 o'clock President Evans called the meeting to order and announced a vocal selection by a quartette consisting of Mrs. B. F. Boller, Mr. and Mrs. Wilcox and Mr. Howard Stryker. "Come Where the Lilies Bloom" was given, and the applause that greeted the singers was continued until they responded to an encore with "Juanita."

The papers read and discussed last evening were "Strawberries," by B. F. Smith, of Lawrence, Kas; a second paper by Mr. J. T. Mider, of Wathena, Kas., on "Fruit-growing Along the Missouri," during which "My Country, Sweet Land of Liberty," was sung by the entire assemblage.

"Poor Old Missouri," by Captain E. T. Hollister, of St. Louis, was the very opposite of what the title might suggest.

"Harmless Drinks," an excellent paper by Mrs. B. F. Boller, was read by the lady with splendid clearness and effect. It contained many beautiful thoughts, as well as solid morsels of wisdom, and the audience testified their hearty appreciation in generous applause.

Rev. Dr. E. S. Curry, of Howell county, read a paper on "Geology." He told of the mound builders and relics of this wonderful race, and exhibited a copper hoe, tempered as steel, and a short handle welded on as no one knows how to work copper metal in this civilized age. Mr. Curry exhibited geological charts to illustrate his essay. His exposition was interesting, and showed a knowledge deep in the researches of ancient race and geological lore.

Prof. Walters, of Kansas City, read a paper on "Problems," dealing on the social and economic questions of the day. This concluded the program for the evening, and an adjournment was taken until 9 o'clock this morning.

Following is to-day's programme:

MORNING.

Prayer, Rev. B. F. Boller.

Business meeting.

Reports of committees.

Report of Secretary.

Report of Treasurer.

Election of officers.

Discussing exhibit at Chicago.

Selection of place for next meeting.

"The Farmer's Flower Garden," Edward Brown, Sedalia.

"The Farmer's Yard," H. T. Burris, Clinton.

"Shaw's Garden" Prof. Wm. Trelease, St. Louis.

"Refrigerator Cars," J. M. Rice, Sarcoxie.

AFTERNOON.

"How to Grow a Peach Orchard," W. G. Gano, Olden.

"How to Grow a Pear Orchard in East Missouri," R. J. Bagby, New Haven.

"In West Missouri," Wm. Maxwell, St. Joseph.

"How to Utilize Our Fruits," Wm. Brodbeck, Oregon.

"Progress and Prospects of the Horticulturists of Missouri," F. A. Sampson, Sedalia.

"Injurious Fungi," F. Lionberger, Hugo.

"How to Grow the Plum and Cherry," G. W. Hopkins, Springfield.

"Trials of an Apple Packer," Henry Speer, Butler.

Reports of County Societies.

Reports of committees.

EVENING.

Music.

"How to Make and Plant a Lawn," Prof. M. G. Kern, St. Louis.

"The Mission of Flowers," Mrs. G. E. Dugan, Sedalia.

Music.

"Birds," Prof. H. W. Speeking, St. Louis.

"Comparisons in Fruit-growing," Capt. E. T. Hollister, St. Louis.

"Old Orchards," R. Lynn, Tarkio.

Music.

"The Uses of the Beautiful," Ralph Smith, Laclede.

"What Good do Horticultural Societies Accomplish?" Prof. G. L. Osborne, Warrensburg.

Music.

Reports of committees.

Adjournment.

NOTES.

The judges will make the awards to-day.

Up to last evening ninety-six delegates had inscribed their names on the Secretary's register.

A large number of ladies graced the audience with their presence during the afternoon and evening.

Messrs. Howard Stryker and Bert Leake rendered a charming vocal duet at the opening of the afternoon session.

The delegates partook of their mid-day luncheon in the court-house building, and fruit for dessert was not lacking.

Secretary Goodman has prepared an elaborate and authentic report of the horticultural interests. It will be submitted to-day, and is well worth hearing.

Messrs. Shepherd & White, of Lamonte, had a ten-gallon keg of excellent cider on tap in the exposition room yesterday afternoon, and all visitors were treated to a generous mug of the appetizing drink.

Preliminary to reading his paper, Dr. Curry said he had been introduced during the day as a "scientificist, one who digs up the remains of the ancients from their graves." "Both gentlemen were from Kansas, however," said he, "so I suppose the word is permissible."

Dr. Curry, in his lecture, exhibited an ear of corn grown from seeds found in one of the Mound-builders' burial places. He said that a stalk grew from one of the seeds planted by him to a height of fifteen feet, was seven inches in circumference at the base, and was unlike any of the corn grown in the present day.

Dr. J. M. Allen, of Liberty, who read a learned dissertation on "The Germ Theory of Disease as Applied to Vegetation," on Tuesday evening, is a great admirer of the Queen city. Said he yesterday: "Sedalia is the prettiest little city in Missouri, and without a rival. The capital should be located here. I have always used my best endeavors to bring about such a result, and will never feel that justice is being done by the voters of the State until the removal is accomplished." The doctor knows a good thing when he sees it, without doubt.

The horticulturists have concluded their labors, and last night adjourned *sine die*. All the fruits on exhibition will be taken to Springfield to-day for a horticultural exhibit at that point.

At 9 o'clock yesterday morning the opening session of the day was called to order by President Evans, and the short hours of the forenoon were taken up in the reports of the committees on railroad transportation and fruit measures, and in a discussion upon the exhibit at the World's Fair.

The following resolutions recommended by the committee were unanimously adopted:

A resolution that, in view of the large and rapidly growing shipments of fruit, the railroads be requested to reduce rates on horticultural products.

Another, that the following measures recommended by the committee be adopted as the standard: For apples, a barrel twenty-eight and one-half inches in length, with chimes three-quarters of an inch at the ends, diameter of heads seventeen and one-quarter inches, and diameter of center, inside, twenty and one-half inches. For peaches, a six-basket crate for fancy, and a third-bushel box for medium to small peaches. For small fruits, a full dry-measure quart box shall be used except for red raspberries, which shall be a shallow pint box.

The standard size of apples must be as follows: Ben Davis and other large apples, not less than $2\frac{1}{2}$ inches in diameter. Winesaps, Genitings and others of that size, shall not be less than $2\frac{1}{4}$ inches in diameter, and all shall be free of worms, scabs and bruises.

N. H. Gentry and Prof. J. K. Gwynn, of the World's Fair commission, were present, and a short discussion was had relative to the horticultural exhibit at the Exposition. No committee on horticultural display will be appointed until after January 1, but the Society was granted permission to purchase 100 glass jars in which to prepare the display of fruits in jars.

A resolution was adopted urging that should an extra session of the Legislature be called, the appropriation for Missouri's exhibit be increased to \$500,000.

Immediately upon the resumption of business after dinner, the annual election of officers began.

There were three nominations for president—J. C. Evans, of Harlem; C. C. Bell, of Boonville, and N. F. Murray, of Oregon. The vote stood, Evans 57, Bell 2, Murray 3. Mr. Evans' re-election was made unanimous. The other officers elected were:

First Vice-President, N. F. Murray, of Oregon.

Second Vice-President, Samuel Miller, of Bluffton.

Secretary, L. A. Goodman, Westport.

Treasurer, A. Nelson, Lebanon.

The selection of the place for the next meetings—June and December—was then taken up, and Sedalia, Chillicothe, Carthage, Pertle Springs and Lamar each presented their claims. The matter was referred to the Executive Committee for a decision.

On motion, John Burr, of Leavenworth, Kansas; Judge Samuel Miller, of Bluffton; Miss M. E. Murtfeldt, of Kirkwood; Herman Yaeger, of Neosho, and Prof. M. G. Kern, of St. Louis, were made honorary members of the Missouri State Horticultural society. The first named gentleman was 91 years old yesterday, and the action of the Society was a very appropriate compliment.

Prof. Duffy, of St. Louis, read a paper on "Spraying," with practical illustrations.

A paper on "Refrigerator Cars" was read by J. M. Rice, of Sarcoxie, and "A Plea for Shows," at the afternoon meeting.

Secretary L. A. Goodman made his annual report, after which the following resolutions were adopted:

One by C. C. Bell, of Boonville, that the Secretary in preparing the program for next year's meeting limit all essays to fifteen minutes' duration.

A second, amending article 3 of the constitution, increasing the number of officers by creating the office of second vice-president.

A third, amending article 8 of the constitution, to make it compulsory upon the Treasurer to furnish bond in twice the sum of the amount he would be expected to handle.

This last was induced by the action of the officers in regard to the last treasurer, J. H. Logan, of Nevada. At the time of the December meeting, in 1890, at Clinton, Treasurer Holman, of Springfield, who had served for years, lay dying, and no Treasurer was elected. Later, Mr. Logan was appointed. He gave no bond, and shortly after his acceptance of the office, Secretary Goodman turned over to him the funds of the Society, between \$1,200 and \$1,300. This money Logan deposited in the Nevada bank, which closed its doors on the following day. It is said that the bank officials knew this money would be deposited with them, and held off the failure until it was received.

Secretary Goodman, President Evans and ex-Treasurer Logan will make good the loss out of their own pockets.

Messrs. G. F. Espenlaub, of Rosedale, Kas.; W. S. Perrine, of Centralia, Ill., and C. I. Robards, of Butler, Mo., the judges on awards, made their report and the following premiums were awarded :

- J. H. Monsees, of Beaman, fifteen plates of apples, \$4.50.
- Olden Fruit company, of Olden, Mo., twenty-five plates of apples, \$12.75.
- A. H. Gilkeson, of Warrensburg, eleven plates of apples, \$2.00.
- Turton and Keith, of Holden, twenty-six plates of apples, \$12.25.
- Shepherd and Wheeler, of Lamonte, sixty-six plates of apples, \$21.00.
- A. Nelson, of Lebanon, fifty-one plates of apples, \$15.00.
- Sam. Miller, of Bluffton, twelve plates of apples, \$3.50.
- N. F. Murray, of Oregon, five plates of apples, \$2.50.
- S. W. Gilbert, of Thayer, thirty plates of apples, \$7.00.
- L. Geiger, of Boonville, three plates of apples, \$1.00.
- J. Kirchgraber, of Springfield, eighteen plates of apples, \$6.
- D. S. Helvern, of Mammoth Springs, Ark., seven plates of apples, \$2.50.
- J. H. Logan, of Nevada, eight plates of apples, \$3.
- C. Tuebner, of Lexington, four plates of apples, \$1.
- M. Butterfield, of Lee's Summit, six plates of apples, \$3.
- J. Gamble, of Brookfield, sixteen plates of apples, \$3.
- E. W. Young, of Fayetteville, one plate of apples, 50 cents.
- W. H. Carpenter, of Avalon, one plate of apples, 50 cents.
- Z. T. Russell, of Carthage, one plate of apples, 25 cents.
- A. Nelson, of Lebanon, one plate of apples, \$2.50.
- G. F. Tippin, of Springfield, one plate of apples, 50 cents.
- C. Tuebner, of Lexington, one plate of apples, \$1.
- D. S. Helvern, of Mammoth Springs, Ark., one plate of apples, 50 cents.
- D. M. Dunlap, of Fulton, one plate of apples, \$2.50.
- W. G. Gano, of Olden, one plate of apples, \$1.50.
- Turton & Keith, of Holden, one plate of apples, 50 cents.

B. F. Smith, of Lawrence, Kas., one plate of pears, \$1.

G. A. Deitz, of Olden, collection of evaporated fruit, \$10.

Conrad Hartzell, of St. Joseph, best collection of apples kept by his plan, \$5.

On flowers, the following awards were made :

Chas. Koeppen, of Sedalia, largest and best display of plants and flowers, \$12.

Phillip Pfeiffer, of Sedalia, second best display, \$5.

J. E. Kirchgraber, of Springfield, best display of cut flowers, \$3.

The judges of the floral exhibit were Mrs. Samuel Miller, of Bluffton, Mrs. G. E. Dugan, of Sedalia, and Mrs. A. Nelson of Lebanon.

The papers read at the evening session were :

"How to Grow an Apple Orchard in North Missouri," by N. F. Murray, of Oregon.

"The Mission of Flowers," by Mrs. G. E. Dugan, of Sedalia.

"Progress and Prospects of the Horticulturists of Missouri," by F. A. Sampson, of Sedalia.

"Entomology," by Miss M. E. Murtfeldt, of St. Louis.

"Some Summer Lessons," by E. L. Pellard, of Cameron.

A resolution was offered by Mr. A. Ambrose, of Nevada, and adopted, that extensive nursery displays at the meetings of the Horticultural society were not productive of much good to the society.

The Finance committee made their report showing a balance of \$47.07 due the treasurer up to the beginning of the present meeting. The report was not satisfactory, and it was referred back to the committee.

The only fun of the session was deduced when the Committee on Final Resolutions presented their report. One member jumped to his feet and objected to thanking the railways for courtesies, because he had been overcharged for the transportation of his exhibit; another kicked on expressing regards for the hotels, because one of them went back on its agreement and overcharged; another wanted that clause stricken out where the mayor was thanked for tendering the members the freedom of the city, because, he said, they would have had that anyway. For a time everybody wanted to talk. The Chair put the question to a vote, and before the kickers had a chance to say "nay," he shouted, "the ayes have it," and the resolution was adopted.

At 10:05 p. m. the convention adjourned *sine die* without designating the next place of meeting.

THE SEDALIA MEETING.

TUESDAY, Dec. 1, 1891—7 P. M.

Music.

String band, led by Prof. Gregg.

Opening prayer by Rev. A. H. Stephens.

Music.

"Praise Waiteth for Thee," by choir.

Welcome address by Mr. Carroll, acting mayor :

Members of the State Horticultural Society :

We are pleased to have you here, holding your thirty-fourth annual meeting. Allow me to surrender the city to you for the next few days. Anything that you see that you want, take it. If you want anything you don't see, let us know, and we will get it for you, and if we haven't it, we will probably be able to make it for you. Missourians have come to believe that when they try they can make almost anything. You are entirely welcome to the city, and we hope your visit will be pleasant and profitable.

Response by President J. C. Evans :

I am glad we did not exhaust our resources for Thanksgiving a few days ago, but that we have still something left for which to give thanks. We thank you for your kind welcome; we know we will have a good time here; we knew it before we came here. Now for a little more music, and we commence our regular program.

Music by Prof. Gregg's string band.

"The Germ Theory of Diseases as Applied to Vegetation," by Dr. J. M. Allen, Liberty, Mo.

GERM THEORY OF DISEASE AS APPLIED TO THE VEGETABLE KINGDOM.

In comparative physiology, we see similarity between the beginning, history and termination of animal and vegetable life.

Each has its birth, childhood, manhood, decay and death. The death rates, at the various periods mentioned, are somewhat similar. The number of each that reach full development and live a useful life are again similar.

The forces in nature, which are destructive to their growth and development, are again similar, excepting insects, which destroy more of vegetable than animal life; but when we pass below insect life, to the lower forms of life, micro-organisms, the excess of destruction is in animal life, so far as we scientifically know at present.

Yet, in reviewing the causes of death in vegetable life, I am inclined to think this field of inquiry has been overlooked, and that the future will increase its importance as a cause of death in the vegetable kingdom. The natural desire in animal life is to resist death; this is manifested, to some extent, in the vegetable kingdom; both show about an equal love of life in their movements within the limits of the forces they control—the animal life controlling far more of these forces than the vegetable.

Animal life depends almost wholly on vegetable life, the products of which it subsists on.

Vegetable life subsists on the forces of nature arranged by God. But the increase of animal life, under the laws of civilization, disarranges the order of life of both, thereby forcing animal life to protect the vegetable from the baneful influences of civilization for its own sustenance.

All the animal kingdom seems to show some degree of intelligent action; this is beyond dispute; whether I would be warranted in ascribing to the vegetable kingdom more intelligence than natural selection, I am unable to say.

God has made man in the image of his Maker, and endowed him with faculties of mind, with which, when properly directed, he is, to a large extent, enabled to gratify that innate impulse and desire of self-preservation.

Standing, as he does, at the head of the animal kingdom, with this God-given endowment of mind, he is enabled to distinctly to see that his perpetuation depends largely on the perpetuation of the vegetable kingdom, and to this end he is now lending his energies—not that I would be understood as a vegetarian, for I am not; but it must be remembered, that part of the animal kingdom from which man draws his supply of animal food, is dependent for life on the vegetable kingdom; therefore, man, to get this supply of food, is forced to protect the vegetable kingdom.

Carrying out the Darwinian theory of “survival of the fittest,” again the similarity of the vegetable and animal kingdoms is apparent in the forces which are destructive to their lives.

In the various varieties of germs of the lowest forms of life, it is not yet established whether any of the same germs are destructive to both, yet further research may do this; it is my opinion that this is more than probably true.

The study of germ-life is comparatively recent, and the field is prolific for grand results, both in the animal and vegetable kingdom.

This study has been confined to the animal kingdom, and particularly their effects on man (and some of the animals).

Before we advance further on this subject, we will answer the question, “What is a germ?” It is a particle of protoplasm or cell, endowed with life and irritability, and the power of natural selection; some of them have the power of moving themselves; their size is infinitesimal; to be seen, requires a magnifying power from 300 to 700; it is subject to fixed laws; its movements are either through or by the air, or they may attach themselves to various articles and move with them; their lives are various in regard to time; under favorable conditions they may live for a number of years, then develop rapidly; they have fixed laws for propagation, which are as follows:

1. Simple budding, as the yeast plant.
2. By fission, in which one individual divides into two.
3. By true spores or eggs developed in the interior, as eggs are developed in the interior of the segments of a tape-worm. The forms and names are as follows: Micrococci—They are the round and oval forms; Bacilli are the short stem-like forms; Spirilli, the spiral forms.

Sometimes the diseases they are known to produce are known to indicate them: for instance, the Bacillus, Anthrax and Bacillus tuberculous: they are of distinct and different varieties, each having peculiarities of their own with reference to their necessity of their life and propagation; in other words, the environments of the germ have as much to do with its life, growth and propagation as do the environments of the human being.

For convenience and study they are divided into pathogenic and non-pathogenic (disease-producing and non-disease-producing). Some have certain points on the earth's surface, where they originate, and are then disseminated over the world along the lines of commercial travel. For instance, the cholera germ originates on the Ganges; yellow-fever germ in the West Indies; typhus germ in the jails of Europe. There may be others that have certain points of origin, but a large percentage of them are common to the civilized world. They are affected positively by climate and temperature. Cholera rarely exists in cold climates or during low temperatures; frost puts a stop to the yellow fever and malarial germ. There are others that do not seem to be much affected by temperature, yet all are somewhat so. There are some parts of the earth's surface that seem not to have the essentials for the life, etc., of certain forms of germs. This appears particularly so with the germs of consumption, malaria, yellow fever and putrefaction. When these germs are taken to these localities, they become attenuated and finally become extinct.

This is true of malaria, which does not exist long in a high, dry altitude. The fact that there are points west of us where fresh meat may be hung up indefinitely in the open air without the degenerative process of putrefaction, shows the absence of the germ of putrefaction.

There are points where consumption never existed originally, and persons sent there with hereditary tendency may escape.

There is no question but what we have inhaled these pathogenic or disease-producing germs without having disease to follow.

This is explainable by there existing within us the power to resist the encroachment of the enemy. This, in medicine, is called "*vis medicatrix naturæ*."

Several factors enter into the production of this condition, viz., robust health, age, sex and environments. When disease-producing germs enter the blood, they may be destroyed by the white corpuscle.

When germs attack the human body, they seem to have a natural selection for certain fixed points, and it is rare to find them elsewhere. This must be the result of certain tissue conditions, which furnish the essential of food for their sustenance. This is exemplified in the *Bacillus Tuberculosis*, which certainly often enters healthy lungs without producing disease, but when it enters the lung of one who has a hereditary tendency, it surely produces the disease.

While all this has no direct bearing on the subject, I have taken this method of bringing before you some of the actions of germs on animal tissues, and the evidences of natural selection; then to draw therefrom the analogy of their action on the vegetable kingdom.

It is to be regretted that more investigation on this department has not been made by horticulturists, they having confined themselves mainly to the study of insect, moth and fungi life, and their effect on the vegetable kingdom; not that I assume that the latter is less important—I think it more important—but both are important, and may have a close relation to each other in cause and effect.

It is yet an open question whether it is the germs or their excrementitious matter that produces the disease; it is also a question whether the germ or the excrementitious matter is not carried and transplanted by insects.

To make an application of the principle advanced, we will begin with the tree. Naturally, it begins life from a seed, drawing sustenance mainly from the ground, until it begins leafing. After full development, and possibly before, it only draws about five per cent from the ground, the remaining ninety-five per cent from the

atmosphere; this being true, it is a question if we have not been giving too much attention to the ground and roots and too little to the foliage, which should be developed to the fullest extent.

Many orchards are injured by close planting, which deprives the tree of breathing room, and lessens the resources of sustenance drawn from the atmosphere, as well as increasing the dangers of contagion.

I will assume that the vegetable kingdom has, like the animal kingdom, an inherent power to resist the encroachments of micro-organisms. Whether this power resides in the sap or not I am unable to say, although the experiments I have made in this direction incline me to believe it does.

All will admit that robustness of growth is a factor in protecting trees from attacks of organisms.

It is an established fact that any variety of seedling, all things being equal, is harder than grafted fruit; this is particularly true in the pear tree.

This opens the question of grafting, as to whether we have not gone too far in that direction for the sake of variety and quality; but if we must graft, two points must be carefully considered: the relative possibility of development of the roots, and foliage; neither should be in excess of the other.

It is a well-known fact that some varieties of trees are not liable to the attack of some of the forms of micro-organisms: for instance, the pear-blight rarely attacks the plum, damson, apple and cherry.

It is also an accepted fact, as before stated, that many micro-organisms radiate from a common center; this being true, it behooves us to make selections of fruits with reference to these points.

It is never wise to force nature to do that which she indicates should not be done; careful studying of these points would enable us to make selections that would insure success.

The literature of horticulture is so meager on the subject of micro-organisms, that I have been unable to collect many facts on this subject; I find, however, that the accepted theory of the cause of blight is that it is a micro-organism of the Bacteria family; this discovery was made by Prof. Butler; those I have seen, in my opinion, belong to the Bacilla family.

It is stated that this microbe selects a point of the bark where it is broken to make its attack. I have not found this true, nor do I believe it necessary; its most frequent attacks are made above the trunk, generally on the younger branches; in its attack on the bark, it makes either a serpentine line pointing downward, or it makes a perfectly circular line; it penetrates the different layers of bark slowly, until it reaches the woody fiber, then its track is almost uniformly downward; after it reaches the woody fiber, it destroys the circulation of sap from the point of attack to the end of the sap vein in the leaf; if a leaf begins to turn dark and shriveled, you can trace from it to the point of attack. While the leaf, to the superficial observer, presents the first evidence of the existence of blight, I have always found that this appearance of the leaf was secondary; I have never found the leaf attacked primarily.

It is my opinion, or rather observation, that the most frequent attacks are made on trees under three years old, and the fatality increases with the lessening of the age of the tree, yearlings rarely surviving the first summer; this is the history of the few trees under my observation. I may be mistaken, for this reason: those that are now living and have survived several exposures to the contagion,

may have the inherent power to resist the attack, they having lost only a few small limbs from this source, and are now 12 years old; all of my trees are grafted fruit.

The question, what are the influences of moisture, temperature, soil, etc., that are most apt to induce an attack, I am forced to say I don't know, and don't believe these things have anything to with it. I only know that it does not appear every year, and, when it does, it is always in the latter part of June or first of July.

Next—What are the causes of death to the tree? In my opinion, it is the absorption of the excrementitious matter or poison thrown down by the germs, because the injury to the bark and wood is not sufficient to explain it.

Is it contagious? Yes, and while, by natural selection, it prefers certain varieties of the pear tree, it does attack other fruit trees, and sometimes hard maple, but not so destructively—never killing, and only affecting the smaller twigs of the outer limbs, and only when close to the pear tree.

How may we detect it? This blight is detected in the following way: by inspecting the limb you find some serpentine lines running straight toward trunk of shriveled bark, or these may be circular on the limb; later you will find one or more leaves of this limb becoming first shriveled, afterward turning a dark color.

If the attack is extensive on the limb, all the leaves will turn the same way; the whole bark of the limb presents a shriveled, dried appearance; if you pare the bark, you can easily trace the track of the microbe by decayed tissue; the woody fiber becomes very hard, tough and lifeless. These points of attack may extend down the limb to the trunk, and down the trunk to near the ground.

What is the best treatment? If the point of attack is detected early, before the inner bark is affected, it is only necessary to remove the outer bark and apply a germicide of 1 to 20 of carbolic acid, or 1 to 200 of bichloride of mercury. If it has penetrated beneath the inner bark, the limb should be removed close to its origin, and the stump treated with the bichloride wash, afterward covered with three coats of paint; then the tree should be thoroughly searched, and this treatment applied to any points of attack found.

Next, I would suggest the burning of every particle of amputation from the tree—limbs, leaves and all—and scattering a light coat of straw for four or five feet around the tree, sprinkled lightly with coal oil, then to be burned.

I would then recommend the careful inspection of the whole orchard, and if any farther evidence of the disease existed, an immediate application of the suggestions made, and we can fairly hope to eradicate the disease this way.

As to the mode of destroying micro-organisms, remember each has its peculiarities. Few of them are killed by cold; others it seems not to affect. Heat, when high enough, kills any of them, but the degree differs greatly. Chemical compounds that kill them are known as germicides.

I doubt the possibility of destroying them by any kind of fumigation in the open air; it can be done in a closed room.

As to the chemical compounds, they stand in the order mentioned as to reliability: Corrosive sublimate of mercury, 1-100; carbolic acid, 1-20; sulphate of iron, saturated solution, creoline, eucalyptol, and many others.

What is the probability of giving protection to their ravages? If we take the investigations of Pasteur in the silk-worm, anthrax and other pathogenic germs, I say that it is more than probable that we can fully protect ourselves by placing ourselves in possession of the exact nature, etc., of these micro-organisms, as he did, when he was able to say, "Thus far shalt thou go and no farther."

But, as individuals, or as a society, you cannot do it; it should be the life-work of some one of those persons who has a fondness for this study; the whole expense should be borne by the State, as France did in the Pasteur discovery; it should not be directed by any political party, but should be under the control of the Horticultural society of the State of Missouri.

Each State should have a horticultural department, the chief of which should either be elected by the people or by their society.

Mr. President and members of this Society, let me thank you for the high compliment you have paid me in asking me to appear before such an intelligent and useful organization.

I congratulate the State in having a Society of earnest people, who have for the last thirty years done so much for the financial and other interests of our State.

I have read many of your proceedings, and found a strong vein of common sense and wonderful perceptions into the hidden mysteries of Nature.

I also congratulate the State in having the services and writings of the distinguished Prof. Riley and Miss M. Murtfeldt, whose writings have contributed original knowledge that money cannot pay for nor words describe nor time erase.

J. M. ALLEN, Liberty, Mo.

DISCUSSION.

President Evans—Everybody is invited to join in these discussions, After every paper, we will give opportunity to engage in the discussion. and every member has the privilege of saying something on the subject.

Prof. Duffey—I would like to call attention to one point made by Dr. Allen. In cutting off the branch below the blight, in the pear, you should cut at least a foot below where the blight can be seen, if possible.

Samuel Miller—I will tell you where I have been cutting mine off when they have the blight—at the ground. This blight is a poison which seems to affect the whole tree.

J. T. Mider, Kansas—I have a theory on pear blight. It is through theories that you must arrive at practical conclusions. I think it is caused by electricity, and that we can prevent it by running wires up the trees. We know there is such a thing as silent electricity.

J. C. Evans—For quite a number of years three things have been prohibited from discussion in this Society—religion, politics, and the other is pear blight; but we will consider now that we are discussing the germ theory of disease.

Prof. Duffey—The bacteria that causes pear blight has been discovered, but the remedy has not been applied.

Conrad Hartzell—There is a time to do all things. That time is now to destroy insects and germs. When they are in winter quarters we can destroy more insects in a single day than in all the summer months, when they are on the wing.

President Evans—I consider this a very valuable paper, and one that will set us to thinking in a different line from anything we have ever had before.

Dr. Allen—I feel grateful for the introduction I have received. In the pear blight you must cut off every particle affected. If your orchard is beginning to be poisoned by blight, dig up the blighted trees by the roots and burn them with every leaf and twig connected with it, for it goes from tree to tree.

Electricity does no harm, except when it strikes in large quantities. Indeed, Prof. Tyndall has discovered that a thunder storm destroys many germs in the air. The practical effect of a thunder shower is to destroy the microbes and give us more oxygen. I have seen the microbe of pear blight, but do not know its history. I recommend digging blighted trees and burning them and burning off the ground. The rapidity with which the germs propagate is enormous—millions in a day. You cannot tell what these germs, microbes and lower forms of insects feed upon. They have a very important relation to vegetable life. Sometimes these microbes get upon summer fruit and make it very unhealthful.

F. Holsinger—I would like to ask Dr. Allen a question. Do you get rid of your patients by killing them? You tell us to dig up our diseased trees and burn them.

Dr. Allen—Yes, I would do so if the public good demanded it.

Mr. Holsinger—Some of the best trees I now have once had the blight and recovered. This is especially true in regard to the pear blight. Twenty-five years ago we could tell you all about the pear blight, but after twenty-five years we can tell you very little about it.

Dr. Allen—Some kinds resist better than others.

A. Nelson—What pears are not affected by the blight?

Dr. Allen—I cannot tell you the names of varieties. I did not keep a list of my own varieties. Early kinds are more liable to blight than late ones.

Secretary Goodman—I have received a telegram from Prof. Clark, of Columbia, stating that he cannot be here, but that he will prepare a paper upon "The Fruit Interests" for our report.

COMMITTEES.

The President appointed the committees for the session as follows:

On Fruits.—G. F. Espenlaub, Rosedale, Kas.; Mr. Perrine, Centralia, Ill.; C. I. Robards, Butler, Mo.

On Flowers.—Sam Miller, Bluffton; Mrs. G. E. Dugan, Sedalia; Mrs. A. Nelson, Lebanon.

On Finance.—A. Nelson, Lebanon; W. G. Gano, Olden; N. F. Murray, Oregon.

On Obituaries.—R. E. Bailey, Fulton; D. A. Turner, St. Joseph; F. Holsinger, Rosedale, Kas.

Final Resolutions.—E. T. Hollister, St. Louis; Conrad Hartzell, St. Joseph.

WEDNESDAY, DECEMBER 2—9 A. M.

Opening prayer, Rev. Mr. Black.

HOW TO GROW STRAWBERRIES.

Mr. L. A. GOODMAN, *Secretary Missouri Horticultural Society* :

DEAR SIR—I see you have me on the program for a paper on “How to Grow the Strawberry.” Now, I am not at all disposed to shirk or back down from any duty assigned me that I am capable of performing. I wish I could write just such a paper, but I cannot. Every practical gardener knows that the same treatment or plan of culture that would be proper and right in open, well-drained soil would not apply to hard-pan or low, wet lands; that the varieties that do well in one may utterly fail in the other. Some profitable kinds to plant for small towns or village markets would not pay to plant for the city market; and that setting plants in July and August is all right where the seasons are favorable, but it is not the right thing to do where the seasons are generally hot and dry. In view of all these facts it would be folly for me to attempt to tell everybody everywhere what I don’t know myself. So I think about the best and only thing that I can do will be to try to tell how *we* grow the strawberry *here*, and offer such suggestions as I think might be beneficial to berry-growers in general.

The first thing to be considered is location. Select high, level land, for if too low, you will suffer from late frosts; where too rolling it will wash; and remember it is easier to cultivate in long than short rows. Have the site as near to the dwelling as possible, which will save much time going to and from work, besides being near shelter in showery weather. Preparing the soil should be done in the fall. Take a good 16-inch plow and plow the ground as deep as possible, and as early in the spring as it can be worked, harrow thoroughly, and we are ready for planting.

What shall we plant? If quantity is the object, plant Crescent, Racster or Beder Wood and Haverland; but if for quality and appearance, which the city market demands, then plant: 1st, Bubach No. 5; 2d, Beder Wood; 3d, Warfield No. 2; 4th, Gandy’s Prize. And should you desire to experiment with new kinds, plant a few Lovetts’s Early, Parker Earle, Shuster’s Gem and Enhance.

Next in order is how to plant. Set a straight row of stakes and plant in line with them. Plant rows $3\frac{1}{2}$ feet apart, except every seventh row, which should have a 4-foot space on either side to serve as a drive-way. Set the plants 14 inches apart in the rows. Now all being ready, the planter takes a bundle of 50 plants, dips the roots into water and puts all the fine dry earth upon them that will adhere; then takes a plant in the left hand, separates the roots, pressing them out fan-like, lays them into a slanting hole made with the right hand, then puts a little mellow earth upon the roots, and with closed hands presses down until the plant stands erect, while the roots reach downward full length. Fill up the hole, except to leave a small depression around the plant sufficient to hold a half pint of water,

which is given at once if the ground is dry. After the water has disappeared, the basin is filled to prevent baking. In hot dry weather the plants should be covered with any kind of litter to screen them from the sun for a few days. Stunted plants are worthless. The strawberry should have thorough cultivation, and that means to keep the ground mellow and free from weeds and grass, which may be done with half the work generally given if good tools are used at the proper time. We find the Gardener's Favorite, a one-horse cultivator, and broad sharp hoes, the best tools for the purpose; and I must emphasize, never let the weeds get the start of you.

When plants are well started, shallow cultivation is the best.

From middle to last of July, train the runners to form a new additional row ten inches from each original row after this keep off all runners. As cold weather approaches, haul and drop enough of fresh stable manure between the rows to cover the entire patch, and when the ground is frozen, distribute, covering the plants with the coarser part, leaving them barely in sight; heavy or close-packing material may smother the plants. This is the only satisfactory way that I have found to use unrotted stable manure in the strawberry patch. When put on the ground prior to planting, it is followed by enough of white grubs to destroy the plantation. Wood ashes are good, and may be used freely. In spring when the plants begin to grow, remove just enough of the mulching to let the plants through, leave the rest to hold moisture. Keep down weeds and keep the pickers and berries clean. Hand-pull all weeds that start before picking time. Look out for the best, not the cheapest pickers. Train them to keep off of the plants; to see that the fruit is ripe before they pick it, and that no ripe fruit is left; to put all inferior or small fruit into separate baskets while picking; to pick without stems and yet retain the hulls on the berries, and to avoid jamming the berries. Use best new packages; give good measure; turn the best side up, but never put the largest on top. Plow up the old patch when the second crop is picked; it never pays to renew. If you follow this advice and have as good land as we have in Holt county, you will surely succeed; but if there are better plans, let us hear them, please.

J. N. MENIFEE, Oregon, Mo.

DISCUSSION.

Sam'l Miller—I don't know why any one should set strawberries by hand when he can get a trowel.

Mr. Barnes, N. Y.—I would plant with a spade. Push the spade into the soil, push it back and forth, making an opening for the plant, removing the spade and inserting the plant, finishing with pressure of the foot.

Sam'l Miller—I am seventy years of age, but I can plant as many plants with a trowel as any man can with a spade.

Mr. Helvern, Ark.—We use the bull-tongue shovel plow, going twice in a row. A boy lays the plants on the side of the row, always on the same side, and a man covers them with a hoe, putting his foot upon the soil over the roots of each plant. Two men and a boy will plant two acres a day.

S. W. Gilbert—Will removing the mulch in the spring make the berries earlier?

N. F. Murray—One spring I left the entire mulch on one-half of my bed a week or ten days later than on the other half. It helped to lengthen the season. I never remove all the mulch, but leave enough to keep the berries clean. In regard to varieties, take the Crescent for quantity. Michel's Early was utterly worthless; it produced nothing; I would rather grow the wild ones.

B. F. Smith, Kas.—I once planted four acres with a spade, and did not get half a stand. I now use a trowel. I don't drop the plants. I use a line, a man with a trowel and the plants in a little basket, presses the dirt firmly at the bottom of the hole. I thought most of the people of this country had got over the idea that the Crescent is the best berry. We want a berry we can ship—sometimes that we must ship a thousand miles. I recommend the Captain Jack. It is one of the best for shipping purposes we have. Michel's Early is no good at all.

S. W. Gilbert—I set with a spade and use a tamper made of wood to strike the ground about three inches from the plant, which firms it at the roots.

J. T. Mider—I get down on the ground, having my plants in a large pan, like a dish-pan, and set with a trowel. I have a little water in the pan to keep the plants from dying. I go across the patch backward, like a craw-fish. The common mason's trowel is too narrow. I use a plasterer's trowel, which has the handle in the middle. I firm the plant with my fist.

Another member uses a dibble, like that used by nurserymen for setting grafts—a boy handing him the plants one by one, never dropping them upon the ground.

C. I. Robards—The Glendale is very valuable for shipping.

J. H. Logan—It is one of the best for that purpose. I seldom lose a case of Glendale.

Mr. Barnes, N. Y.—Has any gentleman here much experience with the Parker Earle? [No reply.]

Mr. Upton—I take a spade, and have a boy to carry the plants in water. I set as fast as he can hand the plants from the water one at a time.

Mr. Perrine, Ill.—At Centralia the best growers prepare the ground in the fall. Most of them plant with a spade. They plant early, when a plant will sometimes grow even if merely dropped upon the surface of the ground. There is no trouble about their growing when planted early with a spade. The trowel is too tiresome. We cultivate soon as the ground is dry enough, and cultivate all the season. Sometimes the rows get too thick. To remedy this, we cut the runners with a hoe. Even if the grubs do work upon the plants, we can get a stand by this

early planting. To cover, we use a kind of prairie grass. We like it much better than straw. It seems to have no tendency to compact and smother out the plants like straw. I think we need more thorough cultivation and less acres.

B. F. Smith—Near Centralia they have a very compact soil. It don't dry out like ours. Hence they can set with a spade. I plant with a trowel about ten inches long. I make about three pushes to get the ground right.

Mr. Perrine—We do have a compact clay soil.

Mr. Beck—What does the gentleman mean by early planting? Early spring or early fall? I have been told that August is a good time to plant strawberries.

Mr. Perrine—Early in the spring.

E. T. Hollister—While the subject of strawberries is up, I want to say a word in regard to varieties. I have had a little experience at the business, and know the strawberry market. Nobody works because he likes to work, but from necessity. He will plant the variety that gives the largest results from the least labor. A great many bushels may be produced by growing the Crescent. The first two or three pickings will reach the market in very fair condition; but after that you had just as well abandon your patch so far as making any money by shipping them is concerned. Take my advice and grow something that will not produce so many berries, but something that can be re-shipped if need be.

A member—Thin culture with potash will make the Crescent a good market berry.

S. W. Gilbert—The past season I shipped the Crescent from Southern Missouri to Kansas, Nebraska and Iowa. Nearly all went through in good shape.

E. T. Hollister—I have never known a section yet from which the Crescent arrived in good condition after the third picking.

Mr. Thompson—What shall we plant?

E. T. Hollister—That is a poser. What of the Michel? The Michel from Arkansas arrived in the St. Louis market in good condition, though it is a soft berry. I decided that its good carrying quality was owing to its lack of moisture. It is a dry berry. I know it carries better than the Crescent. I have found that the Hoffman comes nearer to supplying the place of the old Wilson than any variety I know. It is not a large berry, but it "gets there." Glendale is a good shipper. I should recommend its culture where it yields well.

Mr. Helvern—The Michel's Early has always done well near Judsonia, Ark., until last season. It was poor everywhere last season. It

commenced to bloom in February and kept blooming and getting killed by the frost. On the 6th of April we had a hard freeze. It did best in the poorest ground. I think it grows too fast in rich ground. It comes in early, before the weather gets hot. That is one reason why it carries well. The Hoffman I have known for four years. It is a nice berry. I have seen it remain on the vines six days after ripening and still be in good condition.

Henry Schnell—I would like to know if there is any one here who has experience with the Haverland. I regard it as very fine, for near shipment at least. It is as productive as the Crescent, or more so, and will average one-third larger. Lady Rusk is very firm, but it is cracked or divided, many of them ready to drop apart. It is inferior to the Crescent in size.

J. T. Mider—What shall constitute the standard strawberry package? In Arkansas they begin to send berries to our market in the snide or wine quart, so that when our berries come into market we must compete with this small quart. I think there should be uniformity, whether the quart be large or small.

Mr. Schnell—I have been using the dry quart until last season. The box manufacturer, W. P. Mesler, told me that they had quit making the large quart.

Mr. Mider—If we sell in competition with the Arkansas growers who use the small quart, we must use the same to hold our own.

Mr. Upton—I think there is a difference of only two or three berries to the box.

Mr. Holsinger—If you use the small package and put in a better quality of berry, you will do a great deal better than with a larger package of poor fruit.

Mr. Helvern—Eight quarts wine measure will fill a peck full enough if you fill the boxes full. The Arkansas society has decided to use the Leslie wine quart. I think it well for us to use the same measure.

Mr. Lamm—We never sell berries by the quart; we sell them by the box. Let us adopt which is best.

J. H. Logan—I think this is one of the most important questions we have to consider. Berries carry better in small boxes. The red raspberry we ship in pints. If your fruit reaches the market in good condition it will sell for more in small boxes than it would in large ones in poor condition.

J. C. Evans—If you go into a large city you will find a large package. These people have been buying berries so long they have their eyes open; they know the difference. Is not that true, Capt. Hollister?

Mr. Hollister—Indeed it is.

Mr. Mider—I have tried the different boxes with wheat, struck measure. It makes a difference of two and one-third boxes in a case. It makes a big difference to me. I want to do what others do who sell in the same markets.

Mr. Hollister—If the berries don't bring any more in large than in small boxes, use the small; but in nine cases out of ten they will bring more. Arkansas used to ship in large packages. I am willing to admit that a fine berry will sell in any package. Many buyers have found the difference, and they will all soon learn it. The small package will cost you as much as the large; you pay as much for picking, as much for freight and as much for selling. The few berries you save don't amount to much. As soon as our home growers at St. Louis come into market, consignments must take a back seat. Sometimes our home growers buy the Arkansas product, repack and sell for home grown.

Sec'y Goodman—I think we ought to have some standard, and that it ought to be the full dry measure quart.

Mr. West—I am here representing the largest box factory in the country. We make seventeen different quarts, not from choice. We would prefer to make only one, but we supply our customers with what they want. It would be a happy day for us if all growers would all use the same package.

Mr. Blake—The consumer does not seem to be taken into consideration in this discussion. [A voice. "He is not in it."] The difference in size of the boxes is quite a little item to him. It does seem to me that the grower can not afford to sell less than a quart. At first you gave us a full quart, and a berry box is understood to hold a quart, even if you do sell by the box.

Dr. Sloan—I think we ought to refer it to a committee.

Mr. Nelson offered the following resolution:

Be it resolved, That the horticulturists of Missouri do hereby adopt a standard for fruits, to be known as the Missouri standard. .

The resolution was referred to a committee composed of A. Nelson, E. T. Hollister, S. W. Gilbert, Henry Schnell, F. Holsinger.

STRAWBERRIES AT THE AGRICULTURAL COLLEGE, COLUMBIA.

A strawberry, to be worthy of cultivation, must possess health and vigor; if these are wanting it can never prove satisfactory, even though it may have many other most valuable qualities.

Beyond health and vigor, the qualities most valued will vary with different individuals, according to the taste of the grower, or market to be supplied.

In giving a summary of the several varieties of strawberries tested on the grounds of the Experiment station during the past three years, only those are described that have shown sufficient general merit to commend them, or have one or more valuable qualities (in a high degree) to make them desirable as special purpose berries.

The remaining varieties included in the table and not described have not proved, during the three years they have been grown here, of sufficient value to be continued in the list, although they may be valuable in other sections.

STRAWBERRIES FRUITED, 1891.

Names.	Flowers—Perfect, H; Imperfect, P	Color—Light, L; Dark, D	First bloom	Full bloom	First ripe	First picking	Last picking	Size—Scale 1 to 10	Flavor—Scale 1 to 10	Texture—Firm, Medium, Soft	Productiveness, scale 1 to 10	
Alpha	H	MD	Apr. 24	Apr. 30	May 25	May 30	June 18	6	6	F	6	
Atlantic	P	MD	Apr. 27	May 2	May 28	June 2	June 16	7	7	S	7	
Belle Bordelaise	H	MD	Apr. 19	May 1	May 30	June 12	June 16	2	0	S	3	
Belmont	H	MD	Apr. 29	May 6	May 31	June 3	June 13	8	8	M	3	
Bidwell	H	M	Apr. 23	May 2	May 30	June 4	June 15	6	7	M	6	
Bomba	H	D	Apr. 24	Apr. 30	May 22	June 1	June 15	7	7	M	3	
*Bubach No. 5	P	M	Apr. 27	May 6	May 25	June 1	June 18	8	8	S	3	
*Bubach No. 183	P	M	Apr. 23	May 2	May 27	May 29	June 12	8	9	S	3	
Burt	H	M	Apr. 29	May 6	May 28	June 2	June 15	6	6	S	3	
Champion	P	M	Apr. 28	Apr. 30	May 20	June 2	June 13	7	7	S	6	
Chas. Downing	H	M	Apr. 25	Apr. 30	May 29	June 4	June 15	7	8	S	5	
Clingto	H	M	Apr. 24	Apr. 30	May 29	June 3	June 13	6	5	M	6	
Cloud's Seedling	P	MD	Apr. 25	May 5	May 29	June 1	June 13	5	5	F	4	
Cornelia	P	M	Apr. 28	May 6	May 29	June 3	June 13	8	7	F	5	
Covell	H	D	Apr. 21	Apr. 30	May 21	May 25	June 8	7	6	F	7	
*Crawford	H	D	Apr. 27	May 4	May 28	June 3	June 13	8	7	F	7	
*Crescent	P	M	Apr. 24	May 2	May 25	May 28	June 15	5	6	M	10	
Crimson Cluster	P	M	Apr. 24	May 1	May 28	June 4	June 16	6	5	S	8	
Crystal City	H	M	Apr. 19	Apr. 28	May 21	May 26	June 8	8	8	S	4	
*Cumberland	H	ML	Apr. 24	May 1	May 25	May 30	June 13	9	8	S	7	
Daisy	P	P	MD	Apr. 29	May 6	May 29	June 2	June 18	7	7	F	7
Daniel Boone	P	MD	MD	Apr. 28	May 6	May 27	June 1	June 12	8	8	S	6
*Dew	H	MD	MD	Apr. 30	May 6	June 3	June 8	June 16	10	7	F	5
Emerald	H	M	MD	Apr. 22	Apr. 28	May 29	June 1	June 13	7	7	F	4
Euhance	H	M	MD	Apr. 27	May 5	June 3	June 8	June 15	7	7	F	5
Eureka	H	P	M	Apr. 25	May 1	May 29	June 5	June 15	6	7	F	4
Excelsior	H	P	M	Apr. 27	May 5	May 29	June 4	June 18	7	7	M	6
Farnsworth	H	M	MD	Apr. 25	May 5	May 27	June 3	June 12	6	7	M	4
*Gandy	H	M	MD	Apr. 30	May 12	June 5	June 8	June 17	9	8	F	6
Garfield, Mrs.	H	P	M	Apr. 28	May 2	May 25	June 1	June 18	7	5	S	5
Garland	H	P	M	Apr. 28	May 4	May 27	June 4	June 12	8	7	M	5
Garretson	H	P	MD	Apr. 29	May 6	June 1	June 6	June 16	5	7	M	6
Gypsy	H	P	M	Apr. 23	Apr. 30	May 28	June 3	June 13	7	7	M	7
Glendale	H	P	MD	Apr. 28	May 6	May 29	June 3	June 15	7	5	M	6
*Gold	P	L	MD	Apr. 30	May 8	June 3	June 6	June 17	8	8	F	5
Golden Defiance	P	P	L	Apr. 28	May 8	June 2	June 6	June 15	7	7	M	6
*Greenville	P	P	MD	Apr. 25	May 2	May 27	May 29	June 15	9	8	M	10
Harland's No. 1	H	H	L	Apr. 23	May 1	May 29	May 30	June 11	10	8	M	5
Hart's Minnesota	H	H	L	Apr. 24	May 1	May 21	May 26	June 8	3	8	S	4
Hatfield	H	H	L	Apr. 24	May 4	May 28	May 28	June 10	7	7	M	5
*Haverland	H	H	ML	Apr. 24	May 6	May 28	May 28	June 15	8	8	M	8
Henderson	H	P	M	Apr. 27	May 2	May 28	May 30	June 13	6	10	M	4
Itaska	H	P	M	Apr. 24	May 2	May 29	June 5	June 12	6	6	M	6
James Vick	H	P	M	Apr. 27	May 7	May 30	June 3	June 12	5	7	M	6
*Jersey Queen	H	P	L	Apr. 30	May 8	May 30	June 4	June 18	8	9	M	4
*Jessie	H	P	M	Apr. 20	Apr. 30	May 28	June 3	June 10	8	8	S	5
*Jewell	H	P	M	Apr. 25	May 5	May 28	June 2	June 13	8	9	S	5
*Jumbo	H	H	ML	Apr. 24	May 1	May 25	May 30	June 13	9	8	S	7
Kentucky	H	P	P	Apr. 25	May 6	June 3	June 8	June 15	7	6	M	6
*Lady Ruak	P	P	D	Apr. 30	Apr. 28	May 27	May 31	June 8	7	7	F	6
Legal Tender	H	P	MD	Apr. 28	May 6	May 30	June 3	June 18	5	7	S	6
Lennig's White	H	P	P	Apr. 24	Apr. 29	May 29	June 4	June 13	4	9	S	1
Lida	H	P	M	Apr. 25	May 1	May 30	June 2	June 11	8	3	M	8
*Logan	H	H	M	Apr. 25	May 1	May 28	May 30	June 13	9	7	S	7
Louise	H	H	L	May 1	May 5	May 29	June 1	June 12	6	7	S	4
*Lovett's Early	H	H	MD	Apr. 24	May 3	May 28	June 3	June 13	7	6	S	7
Maggie	H	H	M	Apr. 25	May 6	May 29	June 2	June 10	8	5	F	4
Mammoth	H	H	MD	Apr. 28	May 1	May 30	June 4	June 15	6	6	F	5
Manchester	H	H	MD	Apr. 28	May 1	May 30	June 4	June 15	6	6	F	5

STRAWBERRIES FRUITED, 1891—Continued.

Names.	Flowers—Perfect, H; Imperfect, P.....	Color—Medium, M; Light, L; Dark, D..	First bloom.....	Full bloom.....	First ripe.....	First picking.....	Last picking.....	Size—Scale 1 to 10.	Flavor—Scale 1 to 10.	Texture—Firm, Medium, Soft.....	Productiveness, scale 1 to 10.
*May King.....	H	M	Apr. 25	May 6	May 25	June 2	June 13	7	8	M	7
*Miami.....	P	MD	Apr. 27	May 5	May 29	June 6	June 18	8	9	S	7
*Michel's Early.....	H	L	Apr. 18	Apr. 30	May 21	May 25	June 8	7	8	M	9
Miller's Seedling.....	H	L	Apr. 26	May 6	May 28	May 31	June 12	7	7	S	4
*Miner's Prolific.....	H	D	Apr. 24	Apr. 30	May 26	June 8	June 15	7	8	F	9
*Monarch.....	H	MD	Apr. 23	May 2	May 27	June 8	June 13	7	8	F	2
Montreuil.....	H		Apr. 18	Apr. 28	May 26	June 6	June 16	1	6	F	5
Mt. Vernon.....	P	D	Apr. 26	Apr. 30	June 1	June 6	June 15	7	6	S	5
Norman.....	P	M	Apr. 25	May 1	June 2	June 6	June 13	7	6	S	5
Ohio.....	P	M	Apr. 28	May 4	June 1	June 4	June 15	6	6	M	4
Old Ironclad.....	H		Apr. 25	May 4	May 28	June 2	June 13	6	6	M	4
*Ontario.....	H	M	Apr. 24	May 1	May 30	June 4	June 13	8	8	M	6
*Parker Earle.....	M	M	Apr. 28	May 5	June 1	June 6	June 20	8	8	M	10
*Parry.....	P	M	Apr. 28		May 30	June 6	June 14	8	8	F	5
*Patuxent.....	H	MD	Apr. 25	May 4	May 28	June 3	June 13	7	9	M	6
*Pearl.....	H	M	Apr. 25	May 5	May 27	June 2	June 13	7	7	M	7
Photo.....	P	D	Apr. 27	May 4	May 26	June 3	June 13	8	7	M	7
Piper's Seedling.....	H	L	Apr. 25	May 5	May 26	June 3	June 12	7	6	S	6
*Porter's Seedling.....	H	D	Apr. 20	May 1	May 26	May 29	June 13	8	7	S	7
President Lincoln.....	H	M	Apr. 26	May 4	May 30	June 8	June 13	7	7	S	6
*Prince of Berries.....	H	M	Apr. 30	May 6	May 31	June 5	June 15	7	9	M	4
Ray's Prolific.....	P	D	Apr. 23	May 1	May 27	May 31	June 13	6	6	M	6
*Riehl's No. 1.....	P	D	Apr. 24	May 4	May 28	May 30	June 13	6	6	M	8
*Riehl's No. 2.....	H	MD	Apr. 23	May 5	May 28	June 1	June 15	7	7	M	6
Royal Hautbois.....	H	D	Apr. 20	Apr. 30	May 26	June 4	June 15	2	2	F	2
*Shuster's Gem.....	P	MD	Apr. 18	May 2	May 27	May 30	June 15	9	7	S	9
Southard's No. 1.....	H		Apr. 24	Apr. 30	May 26	May 30	June 13	5	5	F	8
Southard's No. 2.....	H		Apr. 24	Apr. 30	May 26	May 30	June 13	5	7	F	8
Stayman's No. 1.....	P	M	Apr. 27	May 5	May 28	June 1	June 15	4	5	F	6
*Stayman's No. 2.....	P	M	Apr. 29	May 5	May 29	June 8	June 16	6	6	F	8
Summit.....	P	M	Apr. 30	May 8	May 31	June 4	June 13	8	7	S	5
Triumph de Gland.....	H	M	Apr. 24	May 1	May 29	June 3	June 10	5	6	M	3
Truitt.....	H	M	Apr. 25	Apr. 30	May 29	June 3	June 13	7	7	M	5
*Van Deman.....	H	D	Apr. 23	Apr. 28	May 26	May 30	June 12	8	8	M	5
*Warfield's No. 2.....	P	D	Apr. 24	May 1	May 28	June 1	June 13	8	7	M	3
Warren.....	H		Apr. 28	May 6	May 30	June 1	June 13	7	7	S	9
White Novelty.....	H	L	Apr. 26	May 4	May 31	June 4	June 10	3	4	S	6
*Wilson.....	H	D	Apr. 19	Apr. 30	May 30	June 2	June 13	6	6	S	8
Windsor Chief.....	H	M	Apr. 25	May 1	May 28	June 5	June 16	7	6	S	8
Woodmanse.....	P	M	Apr. 24	May 4	May 29	June 3	June 15	6	7	S	7
M. A. C. No. 10.....	P	M	Apr. 25	Apr. 30	May 26	May 29	June 11	7	7	M	6
M. A. C. No. 20.....	P	D	Apr. 27	May 4	May 26	May 30	June 15	8	8	F	6
*M. A. C. No. 23.....	H	M	Apr. 19	Apr. 29	May 21	May 26	June 8	6	10	M	7

*Of sufficient value to be recommended for general cultivation or for special purposes.

STRAWBERRIES PLANTED SPRING OF 1891.

Names.	Runners—Scale 1 to 10.....	Foliage—Narrow, N; Round, R; Medium, M.....	Vigor—Scale 1 to 10.....	
Barton	6	M. N.	7	Foliage resembles the Crescent.
Boynton	5	M. N.	6	Foliage resembles the Crescent.
Breda Wood	6	N.	6	Foliage resembles the Crescent.
Edgar Queen	6	R.	8	Leaves large, roundish.
Estell	4	R.	8	Leaves large, roundish.
Felton	4	M.	8	Foliage dark.
Gov Hoard	5	M. R.	8	Foliage dark.
Great Pacific	5	M. R.	7	Foliage resembles Bubach No. 5.
Martha	6	N.	7	Foliage resembles the Crescent.
Michigan	6	R.	6	Foliage medium, round.
Middlefield	6	R.	9	Foliage round, vigorous.
Mt. Holyoke	5	M. R.	7	Foliage medium.
Oliver	6	M. R.	9	Foliage resembles Haverland.
Princess	4	R.	7	Foliage round, medium.
Riehl's No. 4	4	M. N.	8	Resembles Crescent in foliage.
Saunders	4	M.	7	Foliage light.
Shaw	5	R.	8	Foliage dark, vigorous.
Standard	5	M.	9	Foliage dark, vigorous.
Walton	4	R.	8	Foliage resembles Bubach No. 5.
Wolverton	7	N.	8	Foliage resembles Haverland.
Yale	5	M. R.	8	Foliage resembles Bubach No. 5.

Bubach No. 5—A valuable berry for a near market or for home use.

Bubach No. 132—Fruit resembles Haverland in shape; of fine flavor but very soft.

Crawford—Needs good culture; will not bear neglect.

Crescent—Still ranks among the most productive and profitable varieties grown.

Cumberland—An old standard variety; still profitable; valuable as a fertilizer.

Dew—Fruit very large and firm; foliage large and healthy; valuable for the amateur.

Gandy—Fruit large and firm; valuable for its lateness.

Gold—Of good size, shape and flavor, but not sufficiently productive for general cultivation.

Greenville—This variety proved itself one of the most valuable, and is recommended for further and extended trial.

Haverland—A valuable berry for a near market or for home use.

Jersey Queen—Of good size, shape and flavor; unproductive.

Jessie—Blossoms injured by late frosts; unreliable.

Jewell—Fruit large and of fine flavor; not productive.

Jumbo—Same as Cumberland.

Lady Rusk—This variety has withstood the dry weather better than any other variety tested. Berries apt to be double and hollow at the center.

Logan—Berries large and handsome; worthy of further trial.

Lovett's Early—Did not fruit to any extent. The first lot of plants received were mixed and were ordered to be destroyed by the introducer. The second lot were received during hot and dry weather and made little growth. The fruit produced was of good flavor, fine shape, conical.

May King—Of good shape and flavor; moderately productive.

Miami—Worthy of further trial.

Michel's Early—This variety ripened its crop before any other variety tested. Berries of medium size; very regular; color light. Fruit hangs well after ripening; productive. Valuable for its earliness and as a fertilizer for pistillate varieties.

Miner's Prolific—An old and still valuable variety.

Monarch—Berries even in size and shape; attractive.

Ontario—Fruit of good size and flavor; may prove valuable.

Parker Earle—This variety was one of the last to show ripe berries and the last to ripen its fruits. Berries conical, of good size and flavor. Very productive and valuable as a late variety.

Parry—Of good size, shape and flavor, but only of moderate productiveness. A late berry of considerable merit.

Patuxent—Of fine flavor; attractive; but only of moderate productiveness; a late berry of merit.

Pearle—Berries even; slightly conical.

Porter's Seedling—Fruit regular; resembles Cumberland.

Prince of Berries—Of fine flavor, but not productive.

Riehl's No. 1—Resembles Crescent in foliage and shape of berry; fruit stalks short and strong.

Riehl's No. 2—Resembles Crescent in foliage and May King in shape of berry; fruit stalks slender.

Shuster's Gem—Fruit large and of medium flavor; vines healthy and productive; a valuable new berry.

Stayman's No. 2—Resembles Crescent in fruit and foliage; has considerable merit.

Van Deman—Berries resemble May King in shape, but longer, with seeds more distinct. In flavor this variety resembles the German species (*Fragaria elatior*) to some extent; worthy of trial.

Warfield's No. 2—Still holds its place as one of the most profitable varieties.

Wilson—This variety made a much better growth than last season; foliage healthy; berries of medium size and firm; with good care this variety may become a profitable one once more.

M. A. C. No. 23—Fruit resembles Crystal City in shape, but larger; ripens early; flavor of the best; worthy of trial for home use on account of its fine flavor.

J. W. CLARK, Horticulturist.

SMALL FRUITS AT BLUFFTON.

STRAWBERRIES.

In 1891 strawberries were a full crop. Some of the new ones promise well. Thompson's Nos. 7 and 57 remarkably fine; Gen. Putnam also. Brilliant, Prolific, Heath, Rough and Ready and Colossal will all be heard from. A few seedlings of my own may make a name. Payne, on the Cumberland order, is a treasure, and is in my hands to propagate for a friend. But among the well-tried ones Bubach No. 5, Warfield No. 2 and Michel's Early are not found wanting. Enhance, Gem, Mrs. Cleveland, Ohio Centennial, Haverland, Hoffman, Bessie, Regina, Pine Apple and a host of other new ones seem to be worth growing. Ladies' Pine still the best in quality.

RASPBERRIES.

The earliest and best Black Cap is the Centennial; Hopkins next. Seneca, Gregg and Mammoth Cluster all good.

Red ones: Turner and Hansel are both excellent early ones. Shaffer's Colossal largest and most productive of the Reds. Cuthbert is of no account with me. Thwack is much more valuable with me, although not as good in quality as the others.

BLACKBERRIES.

Snyder is still a favorite, and the only objection some find is its small size, but if properly pruned it is fair size. Triumph is a splendid one. Erie large and fine. Taylor's Prolific very hardy and prolific and of extra quality. Stone's Hardy is a good late one. Freed is very much like it, and perhaps one of the best, all things considered. Erie needs no comment, but is simply about just what we want. Minnewaska will make a stir when it is well known; a perfect production.

LUCRETIA DEWBERRIES.

This, I think, will be valuable on poor soil, but on my ground it seems to claim the whole place, so rampant is it in growth.

CURRANTS.

White Grape and Red Dutch are all I have in full bearing. The Fay's Prolific I have thus far failed to fruit, although I have had it for years.

GOOSEBERRIES.

Houghton and Downing are the only varieties that are grown here, and the fruit usually goes to waste, as we don't care much for them.

PLUMS

Were a failure with the exception of Damascus, Lovelands, DeSoto and Golden Beauty, and this latter did not ripen. The trees were loaded and promised well until the rains set in in the fall, when they all dropped off. This is a great disappointment, as I had set great store by this variety. What plums I did get were saved by spraying, and I have come to the conclusion that it is useless to attempt their successful growing without this application.

CHERRIES.

A good crop. Reine Hortense and Napoleon are my favorites, but for quality Gov. Wood excels all others. Of the early varieties we get none, as the birds take them all before ripe. There has not been a bird shot on this place for a year, except for the taxidermist and a few quail for the table.

GRAPES.

Of grapes I have nothing to say, as my vines were not well cared for. Friend Rommel will read us a paper on them I hope. S. MILLER.

HOW TO GROW THE RASPBERRY.

The design of this article is not to present the subject in a scientific manner, but to consider it, as the producer should, in the light of personal experience and observation, which includes every detail, from selection and preparation of soil to gathering and disposing of the crop of berries. The raspberry grows and thrives with more or less luxuriance throughout the temperate zones in rich alluvial bottoms, along the rocky hillsides, in gravelly and sandy soil, along the margin of water-courses, and anywhere that the ground is not swampy or wet. A deep,

rich, alluvial loam is best, but as every one who desires to grow the raspberry does not possess the best soil for the purpose, each one must use the best he has, and make it suitable by thorough preparation, and if not already rich, it should have a liberal dressing of compost well worked in. The best exposure is a northern slope, as the plants would not suffer from drouth as much as on a south slope. A partially shaded situation is advantageous.

Thorough preparation of the soil before planting is of the first importance. Plow and subsoil deep, if possible, but where it is impossible on account of stumps or rocks, it is not necessary, as the decaying roots and rocks will furnish some fertility, and all the drainage necessary during the time the plants will occupy it profitably.

Distance to plant Reds.—Mark the ground three by five feet, and set the plants in fall, if possible, or very early in spring, before the buds start, as the advancing buds are very tender and require very careful handling. Proceed to set the plants by thrusting a spade in the cross and throw out the earth about six or seven inches deep, and have a boy set the plants in and another man to follow and fill in with fine, loose soil, and firm it well about the roots. Cultivate and hoe thoroughly from early spring as long as weeds germinate, and do not allow any fruit to mature the first year, as the plants will become so stunted and dwarfed thereby that they rarely ever recover.

Pruning.—During the following winter, on mild days, cut the canes back to about one foot high, and weak canes to six inches, or entire, so as to get an even growth in the following season or second year.

Cultivate the soil early, medium and late. Remember that "a stitch in time saves nine," and that what is worth doing is worth doing well.

Such varieties as Shaffer's Colossal and Cuthbert, that are tender and liable to winter-kill, should have the young shoots cut back to near the ground every spring, about a week before the fruit commences to ripen. It is the stoutest and most mature canes that are easiest killed, while the later and less mature shoots come through uninjured; so by removing the young canes as above, others will soon start, and by not having so long a season to grow and mature, they will be in better condition to stand the winter; and another benefit derived from the removal of the young shoots at this time is that all of the sap is forced into the fruiting canes, which materially affects the berries in size, quantity and quality. Destroy all suckers as weeds, second, and all subsequent years, and during the following (second) and all subsequent winter pruning consists in removing all the old, dead wood, and if it is only desirable to have a taste of the very earliest little berries to brag about, do not cut the canes at all; and if a few pretty fair and a little later fruit is wanted, cut the canes to five feet high, and for an extra good crop of late large berries, cut to $1\frac{1}{2}$ to 2 feet. The nearer the ground a bud can be induced to start, the more, larger and finer the fruit.

BLACK CAPS.

The distance to plant is 3×7 feet. To facilitate the setting, turn out perfectly straight furrows, 7 feet apart, and have a man go ahead and shape with hoe or spade at the cross marks for the reception of the plants, and a boy to drop the plants, which must be kept moist, and a third one to follow and properly adjust and cover and properly firm the soil. Set so as the bud will be 6 or 7 inches below the surface, but it is not necessary to cover them more than 2 or 3 inches deep. Setting may be done in fall, or if deferred until spring, the work should be done very early, as the buds start very early, and in fact they advance on mild days during winter in

this latitude sufficiently to necessitate very careful handling. The best time to set is unsettled. If the work is done in the fall, the soil bakes about them, and a great many plants fail to show up, but may be filled in by resetting growing plants in spring; and if deferred until spring, other matters are pressing, a great many of the tender shoots are injured, so that they fail to grow, and necessitate replanting.

I set plants last spring from very early to middle of May, when the plants were a foot high and were topped as they were set, and the latest setting have made the best growth and fewest number of plants lost by failure to grow, and the poorest stand and growth are those set when the tips were fairly starting and up to 2 or 3 inches high.

CULTURE FIRST YEAR.

Cultivate and hoe as often as necessary to keep weeds entirely eradicated, and the soil loose and mellow, from early spring until October. Catch-crops between the rows are a nuisance, except very early peas, early dwarf beans or early Cory corn. Sloven, haphazard, lick-and-a-promise work don't pay in the berry patch any better than anywhere else, and he who expects to pick a fortune off a weed patch in these years of low prices will find himself pretty badly left.

It costs less to keep a plat of ground clean an entire season than to clean it one time after it becomes foul.

Top the plants about 8 or 10 inches high, and if it is desirable to increase a variety rapidly, pinch the laterals 2 or 3 weeks before time to layer, and it will start 3 to 6 and 8 buds near the end of the shoot that will make as many plants if properly covered, but they will not be as stout and well rooted as if the shoot produced but one plant from its terminal bud, which produces the very best plants.

PRUNING FIRST WINTER.

Cut the branches 1 foot to 18 inches long, according to the strength of the plant, and weak plants shorter, and if any very weak plants, cut them back to the ground, so that by relieving them from fruiting they may even up with the others by making a more vigorous growth.

The second and all subsequent years, cultivate and hoe as early as the soil is sufficiently dry to work, and as often as necessary to keep the soil loose and mellow and weeds in subjection. A clean, loose and mellow soil is probably the best mulch that can be applied.

Top the young shoots 12 to 14 inches high as fast as they reach that height, and when the laterals get to reaching out and filling the space between the rows, put heavy ducking breeches on the mule to keep the spines from scratching him, and he won't mind going through. The first crop of berries will be 15 to 20 crates, or 250 to 500 quarts, according to variety and treatment.

All subsequent winter treatment consists in cutting out and removing the old wood that has borne the previous season and shortening in the laterals to the center or highest point of the curve for ordinary results, and for best results cut 6 to 8 inches shorter.

When it is decided to destroy the plants on account of becoming unprofitable or run out, cut out the new or young shoots a few days before picking the last crop so as to cause all the sap to flow into the fruiting canes, and thereby increase the size and quality of the berries.

PICKING.

Make preparations in advance by laying in a supply of box and crate material, tacks and nails; erect delivery sheds, have a few crates made and filled with boxes, so as to have no delay or confusion when the press of business comes on. Have pickers engaged in advance, about one-third more than is needed, as some will quit when it comes to enforcing the rules, and others will have to be given the bounce. The labors of a field boss may be decreased by dividing the field into lots of about $\frac{1}{2}$ day's work in a lot. Number the lots 1, 2, 3, etc., and have cards or tags with corresponding numbers, which the pickers draw as they come, in which assigns each picker to their place. The pickers understand that work must be properly and well done before they have the privilege of drawing again. The quantity of berries brought in will indicate the necessity of inspection.

Diseases.—The raspberry is sometimes attacked by rust, similar to blackberry rust. All plants so affected should be grubbed out and burned; and Black Caps are affected by a parasitic fungus that bids fair to become serious in some localities if not checked. It attacks the young wood and berries, and causes the berries to dry up before mature. Spraying with the formula used to prevent mildew and rot in the grape would probably be the best remedy.

Varieties.—Red: Cuthbert, Turner, Thwack and Shafer's Colossal are all popular varieties. Reliance is fair quality, perfectly hardy and sure to bear a good crop.

Black Caps: The Souhegan, Hopkins, Tyler, Mammoth Cluster and Gregg are the leading and standard varieties mostly cultivated.

A new variety found growing wild in Greene county, that is supposed from its resemblance to belong to our wild species, is eight days earlier than Souhegan, and picked last spring at the rate of 35 crates or 840 quarts, on the date of first picking of Souhegan, which picked 24 quarts per acre. It is as large as Gregg, immensely productive, and holds out as late as the latest, and of very excellent quality. It has been christened Bonanza; it is a very rank grower in good soil, branches freely, short-jointed; has wintered better with me than other varieties since 1887. Fruit as large as Gregg, and of best quality, and immensely prolific. I set out one-fifth of acre (400 plants) in the spring of 1889, on rather thin soil, without manure, and picked in spring of 1890 (first crop) 30 crates, equal to 3,600 quarts per acre. Spring of 1891 the second crop commenced to ripen June 6.

First picking—Bonanza, June 8; Souhegan, June 15; Gregg, June 22.

We kept track of the amount picked from the 400 plants to June 22, as follows:

June 6—Bonanza raspberries ripening; birds taking about as fast as they ripen; picked 1 quart for table.

June 7—Picked 2 quarts for table.

June 8—Picked 5 quarts; June 9, picked 30 quarts; June 10, picked 52 quarts; June 11, picked 80 quarts; June 12, picked 86 quarts; June 15, picked 168 quarts; June 17, picked 144 quarts; June 19, picked 144 quarts; June 20, picked 68 quarts; June 22, picked 168 quarts. Total, $942 \times 5 = 4,710$ quarts per acre.

At this date there was as much or more fruit on the Bonanza than an entire crop of any other variety that I am cultivating.

W. C. FREEMAN, Brookline, Mo.

DISCUSSION.

Question—What kind of a parasite is it that works upon the raspberry?

Mr. Freeman—It is a parasitic fungus that causes the berries to dry up before they mature.

Sec'y Goodman—The white scale on the raspberry canes is an insect. I sent specimens to Washington. Prof. Riley says it is an insect. He says the kerosene emulsion will destroy the insect.

Mr. Schnell—My red raspberries have knots on the roots.

Prof. Duffey—There is a plant-louse that works in the ground on the roots. As a preventive, look for it when planting and dip the roots in a weak solution of lye or washing soda, not too strong.

Sec'y Goodman—I will read Prof. Riley's letter:

WASHINGTON, D. C., April 28, 1891.

Mr. L. A. GOODMAN, Westport, Mo.:

DEAR SIR—Mr. Galloway has referred to this division the package recently received from you, and which contains raspberry canes affected by a bark-louse, known as *Diaspis rosæ*. This scale is found upon rose, blackberry and raspberry, and your specimens are very fine examples of the injurious extent to which it sometimes multiplies. The best remedy consists in spraying with a kerosene soap solution, made according to the formula, a copy of which is enclosed on a separate sheet.

Yours truly,

C. V. RILEY, Entomologist.

KEROSENE EMULSION.

Kerosene.....	2 gallons—67 per cent.
Common soap, or whale-oil soap, $\frac{1}{2}$ pound.....	33 per cent.
Water.....	1 gallon.

Heat the solution of soap and add it boiling hot to the kerosene. Churn the mixture by means of a force-pump and spray-nozzle for five or ten minutes. The emulsion, if perfect, forms a cream which thickens upon cooling, and should adhere without oiliness to the surface of glass. Dilute before using one part of the emulsion to fifteen parts of cold water.

Sam'l Miller—I would remove every one of the plants that have knotty roots and burn them. It will spread over a patch of an acre in a year or two.

Mr. Helvern—I find there is a great deal of the woolly aphid in some plantations of fruit, especially apples.

Mr. Holsinger—There is no occasion for alarm about the aphid. It soon runs its course. An orchard in which it was so abundant that the ground was covered with it several years ago, is now healthy. I saw them planting trees at Olden the roots of which would break off, yet they made good trees. It soon runs its race. I have no care about it; I would not refuse a tree if the roots were entirely broken off.

Mr. Teubner—From my experience with the woolly aphid, I think it is like the chinch-bug and some other insects. They come and go.

BLACKBERRY CULTURE.

Mr. President, Ladies and Gentlemen of the Missouri State Horticultural Society :

The paper assigned me, "How to Grow the Blackberry," is the subject of my choice for this meeting. It will enable me to answer many letters asking how to grow the blackberry.

Land that will produce grain will grow blackberries. Plow land as for corn and mark rows eight feet apart, and for the profitable kinds nine feet is better than seven. Mark rows six to eight inches deep and drop eight inches apart in the rows. Root cuttings six to eight inches long are best, but if plants are used, cut all the top off so that the roots may get well established before they are required to supply nourishment for long tops. Early spring is the best time to plant, as blackberries are slow in coming through the ground, but late fall will do. About three weeks after planting, rake and keep the ground mellow for the sprouts to come through. I use a potato digger.

Last spring I planted ten rows a quarter of a mile long. They have attained fully 90 per cent growth, and look like a hedge fence, and promise 25 bushels per acre. Potatoes and other crops may be grown between the rows the first year, after which the vines will require the whole space.

• Plow the ground frequently with a two-horse cultivator to keep down grass and weeds. After the first season blackberries should be plowed often, but shallow, mostly harrowed; deep culture cuts the roots (blackberry roots run near the surface) and is injurious.

PRUNING.

The first season when shoots or canes grow 12 to 18 inches long, cut them off. This can be done with a corn-cutter or hedge-knife. I use a German reap-hook. This clipping off of the canes or stalks will cause the growth of laterals or side branches there in turn, which are also to be clipped off when they have grown to 10 or 12 inches. It is necessary to go along the rows every two or three weeks to do this work, as new shoots will grow up during the summer. The second year let canes grow three to four feet high, owing to strength of canes and varieties, by clipping, as described above; being thus kept within bounds, they will present a neat, compact and productive appearance, instead of resembling stragglers hanging across the rows.

Much is written in books and journals about cutting old canes out soon after berries are picked. Of late years I let the old canes stand till early spring. I claim that as the blackberry and raspberry canes are of a biennial growth—the first season the canes and the second the berries—and after maturity the fruit requires no more strength from the roots.

Blackberries after fruiting 8 to 10 years become unprofitable, and can be easily killed by cutting off all canes as soon as the berries are all picked. Plow the land at once and repeat in two months, after which the land will be better than when the berries were first planted.

After the first year a man can cultivate and prune 20 acres of blackberries, which will yield 60 to 110 bushels per acre, while of raspberries one acre will yield 40 to 75 bushels, and one man can cultivate 10 acres. Of strawberries one man can find all the work he wants on 3 acres, which will yield from 100 to 300 bushels per acre.

VARIETIES.

Early Harvest is the earliest to ripen out of 32 varieties tested on my place. They ripen three weeks before other tame or wild blackberries, which makes them profitable. The canes grow very upright and thick in the rows, but they winter-kill in Vernon county about one year out of four. North Kittatinny is the largest I know of, and has the longest period of ripening, or until most all other sorts are gone in Southwest Missouri. They lead for profit, like Ben Davis apples, but as they winter-kill about one year out of seven, to reduce the crop one-tenth we should plant some iron-clad, such as Snyder's, which have never been known to winter-kill in Missouri.

Lawton is one of the best for family use. Crystal-White, in clear purple and white, is also most delicious for family use. Willson Junior, Erie and other new sorts are also good.

But I expect to test new candidates and give their merits to the public. Space won't admit of the description of varieties, but remember that the Snyder is a small berry; but I have grown them of good marketable size by planting on rich land and pruning closely. I grow Early Harvest and Kittatinny for market.

The blackberry is the most neglected and will endure more neglect than any berry I know of, and for profit to the amount of work required it leads all berries. No berry is more delicious when properly ripened than the blackberry. They melt in your mouth like the honey of the forest. There are none more valuable for medicinal wine, and it has no equal for health, during its season, which is over 60 days.

The blackberry must be the fruit that in ancient times was the food of the gods who, when they found themselves growing feeble and infirm, resorted to to renew the powers of the mind and body.

Pick blackberries for market when you see the birds sample them, and for wine, jelly and family use, wait until you see the bees gathering honey.

JACOB FAITH, Montevallo, Mo.

DISCUSSION.

Mr. Barnes, N. Y.—The Minnewaski blackberry is similar to the Lawton. It is very hardy, and we in New York think it is the blackberry for all purposes.

Mr. Luckhardt—I don't know what the gentleman wants with the Crystal White; it is worthless. I have had it for sixteen years, and most of that time I have been trying to get rid of it.

Sam Miller—The Crystal White has no value.

J. H. Logan—I agree.

Mr. Barnes, of N. Y.—In our neighborhood blackberries are not inclined to winter-kill, but in places where they are liable to such injury the Snyder is the only one that is considered entirely hardy. The Minnewaski is twice the size of the Snyder, and bears all the bushes can support. It is now grown more largely in the Hudson river valley than any other variety.

Sam Miller—After fruiting it two years, I think it is the coming blackberry.

B. F. Smith, Kas.—The Taylor is better than the Snyder; it is later and larger. Following the Taylor, we have Stone's Hardy. Early Harvest does very well, except after hard winters; the berries sell for good prices—better than the Snyder.

N. F. Murray—The Snyder is in the lead in Northwest Missouri, but the Taylor is growing in favor. Mr. Menifee is trying the Minnewaski. Our blackberry crop last season was very abundant, and some let their berries go to waste; but where the marketing was well done, they netted from four to five cents a quart. Berries picked in the early morning carried badly. Those picked in the afternoon in the hot weather carried well. I would not discard the blackberry. I knew one patch of an acre sold on the bushes for two cents per quart, which netted forty dollars.

A. Ambrose—A majority of the berry men in Vernon county are now growing the Kittatinny; it is the most profitable berry.

Mr. Kirk—Here at Sedalia the Taylor is prolific and one of the best we have. The only objection to it is, the vines are straggling. The Kittatinny rusts to such an extent as to make it unprofitable. The main crop is Snyder.

J. C. Evans—No commercial plantation is complete without the Snyder and Taylor both. The one follows the other. If you want something earlier or later you can extend the list.

J. P. Soule—On my farm in northeast Kansas in thin clay soil the Snyder is comparatively worthless. In good, rich soil it was equal to anything I ever saw.

J. C. Evans—The Snyder should be planted on the very best land. If it makes a rank growth, cut it back severely in the spring.

Mr. Kirchgraber—The Kittatinny is the best blackberry at Springfield. The Snyder is too small. From one-half acre of Kittatinny we harvested 125 bushels—4,970 quarts wine measure. They are in rows eight feet wide, two feet in the rows. The ground was mulched in July, year before last, about six inches deep with straw, which was not removed. It kept down the weeds and grass. Last spring we trimmed them back so they looked like they were ruined.

C. M. Williams—I grow the Snyder, but it is inclined to overbear and be small. The Early Harvest I find very productive and remunerative. It comes in before other berries. It is tender. I cover it with dirt, which is cheap. The Kittatinny is a nice, large berry, but it rusts badly and winter-kills. Over-productiveness can be very easily prevented by severe pruning. The Taylor is a very productive, rank grower.

Mr. Blake—The Snyder never fails if you give it half a chance. Other varieties some years produce no fruit at all.

Mr. Culp—My experience with berries fails to find anything to take the place of the Snyder. It has not failed in thirteen years. Cut it two-thirds away in pruning. I have dug up the Kittatinny as entirely worthless. The Early Harvest is valuable for earliness. I have another that is early which was sent from Bloomington. I cannot recall the name.

Mr. E. T. Hollister—I move that the President appoint a special committee on transportation. Carried.

CULTIVATION OF THE QUINCE, GOOSEBERRY AND CURRANT.

To describe this has been assigned me, and although no great success has followed my endeavors to raise the fruit of some of them, think I can tell how it should be done.

The quince is almost invariably grown from cuttings, which should be six or eight inches long, and as thick as a common lead pencil, although wood much thinner will make plants, but not so strong. These can be taken off the trees in the fall and planted at once in rows four feet apart, and six inches apart in the rows. Set them so deep that the upper bud is just even with the surface of the ground, or if a half inch deeper it will do no harm.

If set in the fall, they must be covered pretty well or the frost will heave them. Last fall I put out 1,000 in this way, and at least 90 per cent grew and nearly all were fit to bud in September. They are of the Erect Angers variety, and used exclusively to root pear upon, as the fruit is inferior.

Another plan is to tie the cuttings in small bundles and heel them in the ground, to plant in the spring. Others cut them from the trees and plant at once, with success, in the spring.

Another method is to head back strong stocks at the ground and let a number of sprouts come up. About midsummer the lower leaves of these shoots may be rubbed off and five or six inches of soil banked around and among them.

By fall these will be well rooted and can be set out in nursery rows to make trees, if to be left as they are. All varieties can be propagated in this way.

To grow the fruit, they should be planted in good soil, be well cultivated, trimmed out so as not to be too dense, and the borers kept out, which are even worse on this tree than on the apple. This kind of soil is usually recommended, yet some of the finest I have seen for many years were recently sent me by a friend in Illinois, who wrote that they grew on a poor clay soil. The largest and smoothest I ever grew were from a tree.

CURRENTS.

This noble fruit is perhaps more neglected than any other of equal value; partly owing to our hot, dry summer's heat at times, and because so few know what they really are, and what a delicious pie, jelly and preserve they make; also, a most excellent wine when properly manipulated with sugar and water.

They are easily grown from cuttings. The terminal bud being left makes the top cutting most desirable, and usually cutting one off the end of a young shoot will be sufficient, heading back. They should be taken off early in the fall and put in the same as quince cuttings. By spring they will be well calloused, and many

will have sent out roots. They can also be divided, or offsets taken from the side of the main stem or bush. Some recommend training them as a little tree, while others prefer to leave quite a number of shoots in a stool.

When cuttings are set out to make trees of, the eyes must all be cut out but the upper one or two, and no eyes left grow lower than eight inches to a foot from the ground. They are very handsome when grown thus, but if a borer happens to get into the stem that hill is gone. White and Red Dutch, White Grape, Victoria, Cherry, and lately, Fay's Prolific; the latter promises to eclipse all the other red ones; they are all good ones.

The current bushes should be planted where partial shade exists, as, unless the ground is deep and rich they will be killed in a hot dry season, unless well worked or mulched. On the north side of a rail fence is just about the situation they need. Mine are in an orchard, but the trees are getting too large, and they must be moved before another summer comes.

To grow either these or gooseberries from seed, the seed should be washed out when the fruit is ripe, and kept in damp sand exposed to the weather and planted the following spring. There are improvements to be made in this yet, and it may interest some young folks to try their chances in it.

GOOSEBERRIES.

These are usually grown from suckers or layers, sometimes from cuttings, but my success with the latter has been very poor. As soon as a plant is well established there will be numerous suckers or shoots coming up around the base, which can be taken off, set out, and they will make plants fit to put into a regular fruit-patch in one year. Plant four feet apart for ordinary culture, but if in very deep, rich soil, six feet apart each way is better.

Some prefer to grow them in a single stem at the ground, which is the best plan, but the suckers must be taken away every year, or they will detract from the fruit crop.

Where fruit alone is the object, and no more plants needed, it is best to cut out all the eyes from the main stem, and there will be no suckers after that. They do not sprout from the roots.

The Houghten, Smith's Improved and Downing are the best fully tested ones, are reliable and good. Orange is one that I deem valuable, but the most promising one I ever had was from Oregon, but the dry, hot summer of 1881 killed my only plant. Their uses as a fruit are various with us; they usually go to waste, as there is no money in marketing them, and we have always plenty of other fruit at their time that we prefer.

The newer ones I have not tried. Smith's that stood where the waste water from a pump flowed over the ground where it stood. The soil was rich also.

As to varieties of quinces there are quite a number. Orange or Apple, Pear, Rea's Mammoth, Missouri Mammoth, Meech's Prolific, Fuller, and quite recently one from Alton, Ill., from Mr. Collett, may prove a new seedling or a sort worth watching. The Portugal is a variety that we don't see in the catalogues, yet it bore with me the past fall, and promises well. When the trees are too full, the fruit must be thinned out to have them perfect.

S. MILLER.

DISCUSSION.

Mr. Holsinger—The currant and gooseberry are entitled to more consideration than they get. They will grow in the open ground and in the shade of the orchard. No fruit I have grown has paid me as

well as the gooseberry. It can be shipped to the ends of the earth almost. It will keep for a week. In the early morning you can pick your gooseberries, whether it is wet or dry. If you find a market for them they will pay handsomely. I sold in one season from seventeen bushes twenty-three dollars' worth of fruit, besides what was used in the family. They occupied a space of three by four feet each. I have now about two acres of gooseberries. They sell everywhere, and there is no excuse for the commission merchant to say that they did not come in good shape. The currant is not far behind the gooseberry.

J. C. Evans—I knew a man twenty miles from a railroad who sold 250 bushels of gooseberries at \$2.25 a bushel.

Mr. Barnes—In the Hudson river valley we strip them from the bushes with buckskin gloves on the hand, and run them through a fanning mill. They are generally sold green, when of full size before they begin to color. We prevent mildew by spraying with sulphur in water.

Fay's Prolific is undoubtedly the best currant before the public at present. It has been on the market ten years, and still sells for \$60 per thousand for one-year-old plants.

Mr. Smith, of Geneva, New York, has 80 acres of quinces. His fertilizer for them has been an immense deposit of leached wood-ashes from an old potash factory. He never plows his quinces, but cultivates the surface two or three inches. His quince orchards are said to be the finest in the State. Meech's Prolific is the same as the Orange. He grows the Orange.

Sam. Miller—What is the Missouri Mammoth? Is it a distinct variety?

J. C. Evans—We know it is distinct from any other variety, and believe it is the best.

Dr. Sloan—Are Rea's Mammoth and the Missouri Mammoth the same?

Sam. Miller—They are distinct; Rea's is long.

Mr. Kirk—A drained pond may be made a very great success as a quince orchard.

WHAT TO ASSOCIATE WITH FRUIT-GROWING—DAIRYING A POTENT ADJUNCT.

The fact that so few engage in raising fruit to the exclusion of all other occupations, and the fact that throughout this State almost every other occupation is associated with fruit-raising, leads us to draw at least two conclusions: 1, That there must be a good cause for so doing or it would not be so universally practiced; and 2, that if some other occupation is to be associated with fruit-growing, only such should be chosen as, while developing and after they are developed, can be continued successfully with fruit-growing and should prove helpful to the same.

Of course, different locations and different men would reach different results, and everyone must study his surroundings and his own inclinations, which are largely the guide to the solution of the question: "What shall I associate with fruit-growing that I may safely bridge over the years of want which come before the fruitage, and the years of failure that come afterward?" for these two unhappy conditions must be provided for.

So it is not a new question after all that we are taking up, but it has presented itself for solution thousands of times, and as often has it been rightly or wrongly answered.

And although I understand that it is a new departure for this Society to discuss this phase of things, yet I do not think it should be entirely overlooked; for these discussions may show us how happy combinations may be made which will lead to more profit.

In settling this question for myself, I have associated with fruit-growing the gentle Jersey cow, and this paper is designed to show wherein fruit-growing and the dairy have points of common interest, and why they may be developed together.

If I lived farther from a city, or distant from a creamery, I might have decided differently; but living close to the city, I find that fruit, milk, cream, butter, cottage cheese, etc., when being supplied to a retail trade are all appreciated by the same people at the same time: that is, each family will order one or all of these for the day's consumption, and they seem glad to have them at the same hour and from the same party.

By using ice I have no difficulty in getting the dairy product to the people sweet and fresh, although I may be an hour or two later than the regular dairy wagon.

With me, trade of this kind is limited in summer to parties using ice, for I make only one trip a day in summer and one in two days in winter.

Fruits and dairy products are all placed on the same bill and collected at the same time. Coming daily during fruit harvest gives each family opportunity to order fruit one day ahead in quantities to suit their convenience, and often a standing order is received for weeks ahead.

Being constant and regular in the dairy matter, people learn to depend upon you for fruit, and the one is helpful to the other.

I turn now to notice some of the advantages of the dairy: 1, to fruit-growing, and 2, to the fruit-grower.

ADVANTAGES TO FRUIT-GROWING.

The custom of most fruit-growers to put orchards into clover when a few years old is almost universal. Clover, green or cured, makes the very best of dairy food; and, in turn, the cow converts it into food for the tree and vine, without which I cannot see how a fruit-grower can keep up the productive power of the soil. Every ton of manure produced by the dairy is anxiously sought and can be advantageously used for the immediate want of every class of fruit. Small fruits are to be top-dressed and large trees mulched.

Every ton of bran, hay or straw or fodder that is purchased and converted into manure means better and more fruit, as well as better and more dairy products. I also find that the wagon adapted to carrying fruits can be easily so modified as to accommodate the dairy products.

The same man, the same team and the same wagon are delivering the products of the orchard and dairy to the same parties at the same time. This is certainly economy of time and labor.

I often sell fruit to parties who would not buy if they could not get cream. Especially is this true of strawberries and peaches.

Fruits are usually boxed the day previous to being delivered, and are out of the way of dairy work in the morning before starting to the city. If we have the desirable dairy help we need, they usually make good fruit-pickers, because they are taught to be both careful and cleanly.

Constant occupation through the year afforded by the dairy often enables us to retain the same help year after year until they become experts. This I find is very desirable. A man educated to be patient and particular about his work is worth two men not so educated.

ADVANTAGES TO FRUIT-GROWERS.

Dairying, like fruit-growing, is a progressive occupation, and requires constant reading and daily investigation. Let this spirit once get control of a man, and he is better fit to be a fruit-grower. No occupation upon the farm requires such mental activity as these two branches of husbandry. In many respects they are twins.

The law of selection for milk and butter, and the selection of stocky trees and good bearers; the choice of dairy foods, and the best way to keep them, and the adapting the tree to its proper conditioned soil; the winter care of the herd and the storing of fruits for winter market; the art of making choice golden butter prints and the art of boxing and crating the delicate berries, are all along the same line of study and require the highest possible form of culture and intelligent care.

The fields of investigation are broader, the knowledge more exacting, and these arts more refining and perfecting to the mind and soul of man, than is the study of many of the finer arts. And this is right, because upon the perfection and success of these two occupations depend largely the health and happiness of every class and generation of earth's inhabitants; and it seems that the Divine hand has touched them twice, and they have come to take their place in the more practical sphere in His order of creation than many other arts. In the age of physical development, it did not seem to be then as it is now. Then any butter was good enough and an apple was an apple. But now, in the age of mental activity, when we live so long in so short a time and enjoy so much while we live, gilt-edged butter has grain and flavor, and a color defined and as peculiar to itself as has a painting its peculiar color, or good music its peculiar charm.

The law of selection in breeding for a purpose is as acknowledged now in dairy cows and fruit trees as are the laws of selection for speed or power in the make-up of a railroad engine or an ocean steamer. Great and hidden truths have been unfolded in the development of these two occupations, that are akin to the discovery of the circulation of the blood, or the laws of gravitation; and the world is being righted by these discoveries as well as by those. I can conceive of no high order of mind that would not be interested, profoundly interested, in the pursuit of these two occupations as they are now coming to the front, and not only interested, but enlarged and ennobled.

What else has developed the blushing Jonathan, or Grimes' Golden, or rosy-cheeked strawberry, luscious peach, or winey grape, or, on the other hand, what has given us the queenly Jersey or magnificent Holstein, than that deep hidden grandeur that lies in these subjects, which takes hold of the energies of man and carries him into fields just as inviting and remunerative as have been explored by men in other occupations?

There are characteristics which I claim are of supreme importance. Every man has a right to engage in an occupation that develops his mental powers and builds up his manhood, and broadens his views, and perfects his ability to execute. This is true life. Either of these occupations does this, and both do more: they furnish his table with the purest food and most inviting and harmless delicacies known to the taste of man.

G. B. LAMM, Sedalia.

DISCUSSION.

B. F. Smith—The thought never entered my mind of carrying the milk, cream and butter along with the berries.

J. T. Mider—If I ever had any inclination in one direction stronger than another, it was to be lazy. Horticulturists have too much time to be lazy in the winter season. This paper is just in the line of what I am practicing. I have a barn, but I have not yet solved the problem what to do with the cows during the busy season. I have thought of buying fresh cows in the fall, running a dairy in the winter, and selling the cows in spring. I think in the spring I will build a chicken-house, getting a rubber stamp, putting my name, and the exact date at which the egg was laid, so that the buyer of that egg would know exactly when the chicken in that egg would hatch.

AFTERNOON SESSION.

HOW TO GROW A VINEYARD

Is what I was asked to write about.

Growers of American grapes have three standard works to choose as their guide. They are:

1. Muench's School for American Grape Culture (German and English).
2. Hussmann's The Cultivation of the Native Grape and Manufacture of American Wines.
3. Bush & Son and Meissner's Catalogue of American Grape-vines and Grape Grower's Manual.

All three of these are of Missouri origin, and they are certainly most excellent books of instruction and reference for American vintners. After 25 years of practical experience, I still consider these works our safest guide, and am far from imagining that I could tell you a better way of "How to grow and care for a vineyard."

Such modifications as our peculiar varieties, situation, latitude, soil and surrounding circumstances render desirable, we must find out for ourselves, for they are sure to vary with every individual grape-grower.

While, therefore, I will not repeat what has already been so well written, I do think it useful to mention some important facts connected with our viticulture that will surely revolutionize the whole business.

Spraying with solutions of copper salts has again the past season proved to be a perfect preventive of black-rot and mildew on our grape-vines. It is with pleasure that I repeat and emphasize the declaration made at your last meeting in St. Joseph: "Both black-rot and mildew are under our control, and if we continue to have our grape crops ruined by these pests, it is our own fault."

The ammoniacal solution of carbonate of copper has again given as good satisfaction as Bordeaux mixture, and it is therefore not at all necessary to soil our grapes in order to preserve them.

Concord, Catawba, Telegraph, Delaware, Rogers' and Ricketts' hybrids, Niagara, etc.—in fact, more than nine-tenths of the varieties usually mentioned in the catalogues of our nurserymen—had proved unprofitable here, owing to rot or mildew, or both of these fungus diseases. Now we can grow them to perfection. Three years' spraying has secured me fine crops of more than fifty varieties of grapes that long ago I had been considering utterly worthless.

Four years ago my Delaware vines were almost killed by mildew. Since then I sprayed them regularly. They improved every season, kept their foliage till frost, and now make a finer growth of wood and produce more and better grapes than ever before.

Having been one of the first to discourage the planting of such grapes as mentioned above, it is all the more gratifying to be able to declare that, owing to Prof. Millardet's discovery, we now can and do make them succeed.

Let nobody suppose, though, that I would advise a large replanting of vineyards of Concord, for example. Concords grown in Missouri ripen during the hottest part of summer, when they will not ship or keep well. Besides, their wine is of inferior quality, and it will not pay us to grow more than ourselves and our home market will consume.

California grapes and California wines are now, or soon will be, sold in every portion of the United States. Thus the product of vines improved in the old world many thousands of years comes in direct competition with that of our native vines, whereof the very oldest earlies have not been cultivated 100 years.

Such grapes as Concord and a large majority of the varieties heretofore generally grown east of the Rocky mountains cannot expect to compete with European grapes grown in California.

In order to do this successfully, we must have grapes of as good quality as the varieties recently introduced by Professor T. V. Munson, of Denison, Texas, under the names of "G. W. Campbell," "Rommel," "Brilliant" and "Hermann Jager."

One of these, "G. W. Campbell" (a white seedling of "Triumph"), I have now observed for seven years, and have here grown four good crops of it.

It ripens with Delaware, keeps and ships admirably well; bunch large and grape medium to large. I had it hang on the vine perfectly sound till November, and make a very good raisin.

This grape is as pure, as good and free of pulp as any *Vinifera*, resembling closely the famous "Chasselas" or "Gutedel," and sweeter than the best "Chasselas" I ever ate in Europe. For table use or for wine it would command a front rank in any part of the globe.

And besides the above four varieties which are now before the public, Mr. Munson has on trial a truly wonderful collection of seedlings and hybrids of his own creation. Through his kindness I have received during several seasons past, samples of his best new grapes, and I dare make the following statement:

"If forced to plant exclusively either Mr. Munson's new varieties, or of the grapes we heretofore cultivated, I would, without hesitation, choose Mr. Munson's grapes."

You may ask, how is it possible that one man should have done more in this special branch of horticulture than was accomplished in 80 years by the grape-growers of the whole country.

My answer is, it illustrates the difference between hap-hazard experiments and the methodic work of a practical man, guided by thorough scientific training.

Mr. Munson began with a thorough investigation of the various species of our native wild grapes, their distribution over the continent of North America, and the characteristic traits of the pure type of each species.

Before him all this had been very imperfectly done, and without a view to practical results in the way of uniting the good qualities of various species in intelligently combined crosses.

Few persons have an idea of the amount of investigation, traveling, collecting, study and correspondence Mr. Munson has devoted to this work. The MSS. of it is now in the hands of our national Department of Agriculture and botanists, as well as viticulturists over the whole world, anxiously await its publication.

After a thorough study of this work, the intelligent grape-grower will have no trouble to select or breed grapes for his special purpose, adopted to his soil, location and climate. It will be as feasible to evolve new grapes with special points of superiority as it is possible to breed horses, cattle, etc., for special purposes.

Men like Nicholas Longworth, Frederick Muench and George Hussmann will always be gratefully remembered as the fathers of American viticulture, but it is from T. V. Munson that future generations will date its scientific and rational progress.

HERMANN JAEGER.

NEOSHO, Mo., Nov. 30, 1891.

REPORT ON GRAPES.

We herein present a condensed report on grapes, which may be of interest to the grape-growers of your Society.

This has been a very unfavorable season, the spring being too wet up to July, and then too cold to fully mature any grape up to its natural standard.

We will give the different varieties in the order of ripening and those of the same color together, giving also a rejected list, or those superseded by better and more valuable kinds.

Jewel.—A black grape, seedling of the Delaware, the earliest and best grape of high quality fully tested; bunch medium, shouldered, compact; berry medium; skin rather tough, slightly pulpy, sweet, rich, sprightly, vinous, of the best quality; vine not vigorous until fully established; free from rot and mildew; will hang on the vine long after ripe and ship anywhere.

Superb.—A new early black grape; bunch medium; compact; berry medium, tender, without pulp, sweet, rich, sprightly, vinous, quality superior to Jewel and nearly a week earlier; vine hardy, healthy, vigorous and productive; free from rot and mildew; a very valuable early grape.

Superior.—A new black grape; bunch medium, compact, handsome; berry medium, very tender, sweet, rich, sprightly, vinous, without pulp; quality best; ripe about with Jewel; vine a very strong grower, hardy, healthy and productive; free from rot and mildew. Although this grape does not ripen quite as early as Superb, it is superior to it, more easily grown and a much stronger grower.

Matchless.—A new black, remarkable grape; bunch very large, compact, handsome; berry very large, pure, sweet, sprightly, vinous, with some slight pulp; ripe about with Jewel; hardy, healthy, vigorous and productive; free from rot and mildew; will hang on the vines long after ripe, and will handle and ship well. We know of no other grape so attractive and desirable for market. It has a bright future, and must become popular when known. These last three grapes combined

possess all the qualities desired. No single variety can ever have all of them, namely: earliest in ripening, best in quality, largest in bunch and berry, easily grown, strong grower, very handsome and productive, best for market and wine.

Moore's Early.—A large, early black grape; bunch medium, rather compact; berry larger than Concord and of about the same quality; not as strong a grower, but as hardy and healthy; not very productive; more or less subject to rot; ten days later than Jewel in ripening.

Early Victor.—A medium-sized black grape of good quality, ripe about with Moore's Early; bunch rather large, shouldered, hardy, healthy, vigorous and productive; somewhat subject to rot.

Osage.—A large black grape, seedling of Concord, but larger in berry and about the same quality, and about a week earlier; bunch large, shouldered, hardy, healthy, vigorous and productive; rots some little.

Standard.—A black grape seedling of Delaware, as large in bunch and berry as the Concord, but of much better quality; hardy, healthy, vigorous and productive; an excellent market and superior wine grape; some little subject to rot.

Worden.—A black grape so nearly identical in bunch, berry, growth, hardiness and productiveness with the Concord that they can scarcely be distinguished from each other, except the Worden may be a few days earlier, and is more tender in the skin and will not handle and ship as well; subject to rot.

Ives.—A medium black grape with good-sized compact bunch that colors early, but quite late in ripening; of poor, sour, musky quality, fit only for wine.

Concordia.—A black grape much like Concord, but of a much better quality, about the same time in ripening; about the same in size of bunch and berry; hardy, healthy, vigorous and productive; free from rot and mildew.

Concord.—A Standard black grape, well known, but so subject to rot that in some places it can scarcely be grown, but where it can be, is a valuable grape, hardy, healthy, vigorous and productive.

Eaton.—A large black grape; a seedling of the Concord, of about the same quality, but larger in bunch and berry; hardy, not very vigorous; healthy and productive; a showy grape.

Paragon.—This is without doubt the best large black grape of high pure quality we have; bunch large, compact, handsome; berry large, tender, sweet, rich, sprightly; vinous without pulp; a bag of delicious juice; hardy, healthy, vigorous and productive; free from rot and mildew; ripe with Concord, but will hang on the vines until frost. The most valuable table, market and wine grape we have; easily grown, and will stand all kinds of weather. There is no grape that has as many points of excellence as this.

Black Imperial.—A medium-sized black grape of the very highest quality; bunch large, shouldered, compact; berry tender, rich, sprightly, vinous, of a peculiar fine flavor; hardy, healthy, vigorous and very productive; more or less subject to rot. If this could be fully controlled, it would be valuable.

Cynthiana.—A small black grape of most excellent quality; bunch large, double shouldered; hardy, healthy, vigorous and very productive; one of the most reliable grapes we have; never fails to produce a full crop; free from rot or mildew; late in ripening, and will hang until frost; produces wine of great body and high color, containing about 10 per cent of alcohol, with fine aroma.

Avilla.—A small black grape of the same type and character of Cynthiana; a native of Southern Kansas; rich, sweet, sprightly and vinous; hardy, healthy, vigorous and productive; free from rot and mildew; equal to Cynthiana for wine.

Cherokee.—A black grape of the *Cynthiana* type, but much larger, of the same character; hardy, healthy, vigorous and productive; free from rot and mildew; a good late market and wine grape; raised from the same seed as *Ozark*; more juicy and sprightly, and perhaps more valuable.

Herman.—A small purplish black grape of the *æstivalis* type; bunch long, shouldered, compact; berry rich, sweet and sprightly; very late in ripening; hardy, healthy, very vigorous and productive; free from rot and mildew; one of the most reliable grapes we have; never fails; makes a wine of heavy body and finest bouquet.

Ozark.—A black, remarkable grape of the *æstivalis* type; as large in bunch as the *Concord* and almost as large a berry; a prodigious grower; will produce more than twice as much foliage, cane and fruit as any other variety we ever saw; remains vigorous and green until killed by hard frost, protecting the fruit which ripens late and hangs to the vines until cut, regardless of the weather; a rich, meaty grape of a peculiar pleasant flavor, unlike any other grape; hardy, healthy and productive; free from rot and mildew; valuable for late market, much better than *Cynthiana* for wine.

Perfection.—An early red grape of the best quality; bunch long, shouldered, compact, handsome; berry medium, bright, clear red, sweet, sprightly, vinous; vine hardy, healthy, vigorous and very productive; free from rot and mildew. This is the earliest and best red grape we have, much like *Delaware*, but much larger in bunch and berry. The most perfect and certain of any red grape we have.

Moyer.—A small early red grape of good quality; bunch small, compact; vine feeble grower; not as large in bunch or berry, neither as good in quality, as the *Delaware*.

Delaware.—A rather small red grape which is considered the standard of excellence; bunch medium, shouldered, compact, handsome; berry rich, sweet, not very sprightly, but vinous of the highest quality; vine a slow grower; very productive; free from rot, but subject to mildew.

Eureka.—A red grape; seedling of the *Delaware*, equally as good in quality; bunch large, shouldered, compact; berry medium, rich, sweet, sprightly, vinous; pure as an European grape; vine hardy, healthy, a fair grower; good foliage, and productive; free from rot and mildew. This is a more desirable and reliable grape than *Delaware*.

Brighton.—A red grape of the best quality; bunch large, shouldered, not very compact; berry rather large, tender, sweet and vinous; soon deteriorates after ripe; does not always set fruit well; strong, healthy grower; not altogether hardy; somewhat subject to rot and mildew.

Ideal.—This fine, red grape is one of Mr. Burr's seedlings of the *Delaware*, which is as large in bunch as *Concord*, and larger in berry than the *Catawba*, and better in quality than the *Delaware*; a good grower; hardy and very productive; with us it rots and mildews some; on Mr. Burr's place it does neither. This is no doubt the finest red grape we have, and wherever it can be grown successfully, a valuable variety.

Ulster Prolific.—A red grape of good quality; bunch medium, compact; berry medium, sweet; sprightly and vinous; hardy, healthy, vigorous and very productive; rots and mildews but little.

Norfolk.—A red grape of the flavor of *Catawba*; bunch not quite as large, more compact, berry of about the same size, but of higher and better quality; hardy, healthy, vigorous and productive; somewhat subject to rot.

Woodruff's Red.—A very large red grape of a poor foxy flavor; bunch large, compact, showy; strong, healthy grower, very productive. This grape has no value except to show, make jelly, and perhaps for canning.

Marsala.—A large red poor foxy grape, very much like Woodruff, and of the same character, and good for the same purposes. It is very productive.

Jefferson.—A large red hybrid grape of excellent quality, bunch large, shouldered, rather compact, handsome; very large, meaty, sweet, rich, sprightly, of high quality; healthy and productive, but not hardy; requires winter protection; rots some, but valuable where it can be grown.

Primate.—A red grape; bunch large, compact, very handsome; berry medium, or above, firm, but tender, sweet, rich, sprightly, vinous, of the very best quality; hardy, healthy, vigorous and productive; free from rot and mildew; a very promising new late grape.

White Jewel.—A very early white grape of riparia type; bunch medium, long, very compact, handsome; berry medium, very juicy, sweet, slightly, of good quality; hardy, healthy, vigorous and very productive; free from rot and mildew. The earliest white grape we have, reliable.

Green Mountain (Winchell).—A greenish white grape; bunch medium, compact; berry medium, sweet, of very good quality; hardy, healthy, vigorous and productive; a promising early grape; said to be the same as Winchell.

Leavenworth.—An early white grape; a seedling of Concord; bunch large, compact, handsome; berry large, very firm, but not pulpy; sweet, rich, sprightly, of the most agreeable flavor, with some of the native aroma, that suits the taste of nearly every person; vine hardy, healthy, medium in growth, productive; will hang a long time after ripe and ship well; free from rot.

White Imperial.—An early white grape; bunch large, long, shouldered, compact, handsome; berry medium, firm, tender, sweet, rich, sprightly, vinous, of the most exquisite, refined and indescribable flavor; vine hardy, healthy, vigorous and very productive; very nearly free from rot; does not mildew. This stands at the head of the best in quality of all the grapes we have.

Osceola.—A white grape; seedling of standard; bunch large; berry large, tender, sweet, rich, sprightly, of excellent quality; vine a very strong, handsome grower; very hardy, healthy and productive; free from rot and mildew; a very desirable new early grape; ripe before Concord.

Moore's Diamond.—A white grape; bunch large, shouldered, compact, showy; berry large, tender, sweet, rich, sprightly, with considerable of the native aroma, of good quality; soon deteriorates after ripe and becomes quite foxy; tolerably hardy, healthy, vigorous and very productive; rots and mildews some; better than Niagara or Pocklington.

Hays.—A white grape, seedling of Concord; bunch large, rather compact; berry large, tender, sweet; of better quality than Concord; hardy, healthy, vigorous and productive; rots some.

Victoria.—A white grape, very much of the same character and quality of the Hays, perhaps does not rot as much; about as hardy, healthy, vigorous and productive.

Niagara.—A white grape; bunch very large, compact, showy; berry very large, tender, sweet, not very rich, sprightly; vinous, of considerable of native aroma; a very strong, healthy grower; not quite hardy; very productive; rots and mildews badly; where this grape can be grown it is desirable.

Pocklington.—A white grape; bunch large, compact, showy; berry large, sweet, sprightly, pulpy and quite foxy; vine hardy, healthy, vigorous and very productive; rots and mildews badly.

Elvira.—A white grape, of the riparia class; bunch small, very compact; berries medium, tender, not rich, sprightly, apt to crack; vine very hardy, healthy, vigorous and very productive; good only for wine.

Eclipse.—A white grape; bunch large, double-shouldered, not very compact; berries very large, tender, rich, sweet, sprightly, vinous, of the most exquisite quality; vine hardy, very vigorous, healthy and productive; this is the best very large white grape of high quality we have.

Magnate.—This new white grape is a seedling of Concord; bunch large, shouldered, compact; berry large, tender, sweet, sprightly, better than Concord; hardy, vigorous and very productive; free from rot and mildew; will hang long after ripe; one of the most reliable and productive seedlings of the Concord.

Farrell.—A white grape described "as hardy and vigorous as the Concord and very productive; bunch very large, from nine to ten inches long; berries not quite as large as Catawba; far ahead of Delaware in quality; the best I ever tasted;" it has proven a strong, healthy grower.

Osee.—A white grape of the riparia class; bunch medium, rather short, thick, compact; berry very large, tender, very juicy, of a peculiar not agreeable flavor; good only for wine, which it makes of the very best quality.

Minnehaha.—A white hybrid grape; bunch very long, compact, shouldered; berry medium; very sweet, vinous, of the most delicious quality; vine very vigorous and productive; not hardy; needs winter protection.

White Beauty.—A white grape; bunch large, long, shouldered, very compact, handsome; berry medium, firm, but tender, sweet, sprightly, rich, vinous and of purest and most refined quality; vine hardy, healthy, vigorous and very productive; free from rot and mildew. This is the most perfect late white grape, ripening with the Concord, but hanging on the vine long after ripe, and will handle and ship anywhere.

The following black, red and white grapes in the order named, we reject as unworthy of cultivation, as they are superseded by much better kinds:

Cottage, Champion, Janesville, Hartford, Herbemont, Black Taylor, Clinton, Rulander, Louisiana, *Norton, Telegraph, Mary Ann. Red Grapes—Iona, Diana, Wyoming Red, Catawba, Dracut Amber, Perkins, Salem, Vergennes. The following White: Ann Arbor, Jessica, Lady, Lady Washington, Martha, Faith, Peter Wyllie, Duchess, Green's Golden, Triumph, White Herman, Prentiss, Noah, Empire State, Mo. Reisling, Pearl.

Some persons may no doubt think we have discarded some very good grapes. That we admit, but there is not one that is equal to or can take the place of any we have described. They all have some important defect that can never be remedied without more labor and vexation than they are worth. Why should we grow a lot of fickle, uncertain and poor varieties when we have so many that are much better? Others may think that many that we have described are new and not known; that is also true, but that should not detract from their merit. They would never be known if some person would not try, test and describe them. We have been growing and testing their value as fast and as faithfully as we could, and making the results known, so that when they are put upon the market the public may know what to expect. Some, no doubt, will prove unworthy, but one thing we do know: that this lot of grapes is the best and most valuable ever described, for we have been in the business nearly a half century, and have handled, grown, described and tested the quality of over 2,000 different varieties of fruits.

*NOTE.—The Norton we reject upon the following grounds: We have grown it over twenty years by the side of Cynthiana, and never could see any difference in growth, foliage and fruit, and never saw any person who could. Neither could we see any difference in the wine, although others said they could, it was better. Once we had a very cold winter that did not injure the Cynthiana, but very much injured or killed the Norton. We also think that we can select larger bunches, with larger berries, on the Cynthiana; we saw others who said the same. From these facts we reject the Norton, as the Cynthiana has proven superior to it, and they are too near alike to cultivate both and keep them distinct.

J. STAYMAN, Leavenworth, Kas.

DISCUSSION.

L. A. Goodman—I knew of Prof. Munson's work in looking for the different species of wild grapes; but I did not know that he had accomplished one-tenth part of what he has done in that line. I think we can find here a way in which we can grow such varieties as we wish. I am glad that such work has been done.

A. J. Blake—I have been forcibly impressed by this paper by Hermann Yaeger. The point I wish to impress more particularly is this: The man who says I can't grow grain or fruit according to books and papers I think may be able to use an item or two that will help him along. What has this man Munson done? He has all the books and the papers and has originated and introduced four varieties of grapes.

F. Holsinger—It struck me that Hermann Yaeger is not acquainted with John Burr, who is now 91 years of age. He has a list of grapes, among which is the Jewel. You, Mr. President, know the value of his grapes. I only speak of this to bring his name before you.

President Evans—Mr. Burr seems to have been very fortunate in the production of good varieties. Mr. Munson is working for something a little different from Mr. Burr. Mr. Munson seeks to produce grapes for a special purpose. Jewel and Ideal are two of the best for this latitude, with the Paragon for white. To know much of Mr. Yaeger you must visit his place. To find out what Mr. Munson is doing, you must see Hermann Yaeger. To find out what Hermann Yaeger is doing, you must see Mr. Munson.

Mr. Goodman—You will find in the last report a very excellent paper from Mr. Burr.

Mr. Mider—All these great results of Mr. Burr have been produced on a piece of ground less than the size of this room.

Jacob Rommel—I have tried various varieties with various results. Some varieties, like Ives, you can hardly make any better by growing seedlings. Seedlings of the Delaware varied more than those of any other variety I have ever used. I have had splendid results with the

Delaware; every seedling was good. Some peaches will always produce the same from the seed, such as the Heath Cling and some others. This is my experience.

Mr. Evans—I asked Mr. Yaeger a question. Why do you get so many different seedlings from the Concord and the Delaware? "Because there are so many kinds of blood in them, is all."

L. A. Goodman—Mr. Munson's line is not to find good seedlings, but to breed them, so that he can say just what blood is in his seedlings,

Mr. Barnes—Of Mr. Munson's four seedlings only one will ripen well in New York—the Brilliant.

Mr. Rommel—I think the Concord is very poor in quality. I don't know what anyone wants with Concord.

Mr. Murray spoke favorably of the Coleraine. It is superior to any white grape with which he is acquainted. He thinks it is in the hands of trustworthy men.

FRUIT AS FOOD.

I have been given the topic of the comparative value of the larger fruits. I regret my inability to properly handle this important subject, but with your forbearance, I will state, in a plain way, my views of the value of fruit as food, especially the larger fruits.

The apple, pear and peach for food stand next to wheat, corn and oats. Meat has not nearly the value that these fruits have for food. If the people of this country would discard meat and use fruit instead, it would soon be noticed in their improved health and energy. While now poor health is the rule and perfect health the exception, then health would be universal and sickness the exception.

This is not all; the use of fruit promotes temperance and causes drunkenness to disappear, and improves society in many ways. One needs good health and strong nerves to resist temptation.

Fruit, especially the apple, is very rich in nerve food. There is an old saying to the effect that apples are gold in the morning, silver at noon and lead at night. But my experience is that you can eat apples with good results at any time; they are gold at all times.

Dr. J. A. Kennicott, of Illinois, wrote as follows: "The free use of ripe fruits not only prevents disease, but their regulated enjoyment helps to remove that which already exists."

All ripe fruits are also more or less nutritious. It has been clearly demonstrated that the apple is superior to the potato in the principles that go to increase the muscles and brain of man, and in fattening qualities it is nearly equal to any other food. Ripe grapes have cured epidemic dysentery. Families where fruits are most plentifully used are most free from disease of all kinds, especially from fevers and bowel complaints. Most fruits aid digestion, some directly and some indirectly, and their free use lessens the desire for alcohol or other stimulants. The juicy ones act as diluents, and all as diuretics, the free acids neutralizing the earthy matters in the blood. I could multiply authorities, but it is sufficient to say that all agree as to the healthfulness of fruit.

It is said that the Scotchman attributes his health, endurance, honesty and other good qualities to his use of oat-meal, and all his failings to his use of barley-

beer. But if he would add to his diet of oat-meal a plentiful supply of fruit, especially apples, he would not have an appetite for beer.

I wish to say right here that drunkards are made at the table, and they graduate at saloons; that our food of meats and other highly seasoned and stimulating articles creates a thirst that leads to strong drink.

You may think this a strong statement, but I know what I am saying. Let those who have the appetite for drink change their diet to grain, fruit and vegetable and my word for it, they will have no more thirst for strong drinks. Not only that, but let me prescribe the diet and I will guarantee that not only the desire for drink will disappear, but the appetite for tobacco will give way also.

Now, in conclusion, let me say to the parents who desire to bring up their children in the way they should go, that they should see that they are properly fed; for upon their food depend their health and strength, their power and brain and muscle and their habits of temperance and virtue. Your and their happiness depends upon it. You cannot violate the laws of nature, God's unchanging laws, and not suffer the penalty. The way of the transgressor is hard and full of sorrow; but the way of obedience is the way of life and full of joy and peace.

Nature has supplied us abundantly with most delicious fruit, and man's nature is adapted to its use. Then, my friend, do not forget the apple—

The beautiful red apple,
The beautiful yellow apple,
The beautiful striped apple,
The delicious tart apple,
And the rich sweet apple,
All will give you life and health.

J. H. MONSEES,
Beaman, Mo.

NIGHT SESSION.

Music.

FRUIT-GROWING ALONG THE MISSOURI RIVER.

Secretary L. A. GOODMAN:

SIR—Since you have seen fit to assign me a task, rather than let me choose a theme, I shall not stop to cavil, knowing that to be a good boy one must do as they are bidden. So I shall, with your indulgence, devote my remarks to the subject indicated by the above caption, and in doing this can think of no better course than to give a synopsis of my own trials and triumphs in the vast field of horticulture, for the reason that this will be more practical than anything else I could write on the subject.

Fifteen years ago, or at the age of 26, I bought eighty acres of high-laying land, about five miles on an air-line west of St. Joseph on the Kansas side. This land is what is known as the Loess formation, with a dark loamy surface soil and a porous clay subsoil, which can be easily spaded for fifty feet, or to bed-rock. Every foot of this land was covered with a dense growth of hazel brush, interlaced with grape-vines, with a copious growth of jack-oak and shell-bark hickory, elm and crab-apple. It might be pertinent at this juncture to give a short description of myself by way of a standard for future horticulturists to measure by, and in doing this I can think of no better simile than that of an high-pressure engine standing on the track with 135 pounds of steam, and ready at any moment to pop the safety-valve. Being a descendant of a wiry and hardy stock and in perfect health, there was no amount of physical toil that could weary me; and thus, with

an enthusiasm that was bubbling over, I bought me a new ax and grubbing-hoe and waded into jack-oak and stool-hickory that would make from ten to fifteen cords of wood to the acre, determined to make that wilderness blossom like a rose.

The first half acre I got cleared I had no plow to break it with and no money to buy one, besides being in debt for my land and an old plug team. I dug the whole thing up with the grub-hoe and set out an orchard of thirty-six apple trees. It being a small orchard and near the house, I gave it good attention, and to-day, for its size, it is hard to beat anywhere.

The next step was to utilize that precious ground between the trees, so I traded a load of corn raised on another farm for enough of Wilson's Albany to set out the spaces between the trees, glorious visions of strawberries and cream dancing through my mind all the while, and who knew how many bright, much-needed dollars lay folded up beneath those modest leaves. But, alas, for the delusion of hope, ere the sun's rays began to assume their most vertical slope my darling plants began here and there to wither and die. An investigation proved that in my love for the strawberry I was not alone, but had a numerous company in the form of the white grub, or which when I wish to speak respectfully of them, I say the larve of the May beetle.

About this time I read where some crank said that salt was a good thing for grubs. I don't remember whether or not he said how to apply it, but I knew that salt was a great thing, because my grandmother had often recommended it in my youth as being a very potent factor in catching birds if placed at the proper place on their tails; and where is the boy that would doubt his grandmother; at any rate, if salt was all they needed, I could salt them; so I thought if a little was good a great deal was better. And I want to tell you I put salt enough on that patch to preserve it till dooms-day. I was bound to show those worms that they were dealing with a young man who was posted. Well, all I care to say further about it is that I didn't have any strawberries and cream the next spring, but I do believe I fixed the worms, as I have never had any since to trouble my strawberries.

But I wouldn't be worried out of the strawberry business. So the next spring I traded some more corn for some famous Crescents that another neighbor was just testing his first nice bed of. He was very particular about his precious plants, and warned me not to get on the bed but to take them from around the edges, which I did. Well, I got enough to set out an acre that I had prepared on another part of the farm, where I thought it might not be so wormy. So, with a zeal unabated, I planted them in the most approved style, and what I didn't know then about strawberries wasn't worth knowing. Judge Miller couldn't have held a candle to me at that time.

The next spring came, and on that sun-kissed slope was to be seen a growth of plants unequalled anywhere, matted and interlaced till the ground was nowhere visible. Daily I watched them. Oh! what a wealth of bloom, I remarked one day; and I said, surely if one-third of those blossoms make a berry I will have 500 cases; at \$3 per case will be \$1,500. Well, we will just turn our cabin into a pig-pen, and we will build a nice two-story cottage down on that little knoll by the spring, with a fancy tower on the corner, a veranda extending along the south side, double parlors, with portiers between the dining and sitting-rooms, and folding doors leading to the library, and a bay window looking east from the library, and a hot and cold bath-room on first floor, and—and—

But shucks! what was I talking about? I didn't have three quarts of strawberries on the whole acre. Well, what on earth could be wrong, anyway? So I got the neighbor of whom I bought the plants to come over and examine them.

Here and there we found a bunch or spot that had some fine berries, and he said that he had learned that the Crescent was a pistillate and needed a fertilizer; and he suggested that I plant some Wilsons among them, and they would be all right another year. Well, I proposed that if the dear Crescent was so fastidious that it could not bear without a great array of flub-dubs in the way of fertilizing, we go at once and get a lot of Wilsons and chuck them in here and there and let the work go on, as there were lots of blooms that I thought might yet be fertilized into bearing; but he dissuaded me out of that idea, and I will cut this story short by saying that I worked and thinned and cultivated those pesky things two seasons, only to find out that when I got those plants around the edge of my neighbor's bed I had taken up almost entirely wild plants that had grown in the orchard and run over and into the Crescent bed, and I didn't know the difference between a wild and a tame strawberry. It is useless to tell you that I do now.

I then bought another 80-acre farm lying east, on which was an old field, in which I found some fine wild berries growing. I then sent east to reliable firms and secured a number of the best varieties; fallow-plowed five acres of the old field, harrowed it well, furrowed it out five feet apart with the big plow, during the winter I hauled those furrows full of well-decomposed manure. As soon as the ground would do to work in the spring, with a garden rake I drew about two inches of dirt over the manure and set out my plants eighteen inches apart. The first row on the south was Captain Jack; then came six rows of Crescent; then a row of Wilson, and so on till completed. I took good care of them, kept them thinned properly, and I never before or since saw so many fine berries on one farm. I employed forty pickers the next spring, and although the weather was favorable, I was unable to take care of more than half of them; but with my present experience I might have saved them all with the same number of hands.

But while I might say a great deal more along the line of my experience, I must pass on with the statement that I have never found a better commercial berry than Crescent, though I grow Edgar Queen, a new late berry, Jessie, Bubach No. 5, Lady Rusk, which stand in the order named, and an acre of Michel's will come on trial in the spring, for which I can say that if it bears berries anything like it does plants, it is surely a darling.

I must now take up apples by referring you back to the little orchard of thirty-six trees, which long since come into bearing. But of the six varieties ordered, only one was true to name, and of course it was Ben Davis. However, I don't think there were over thirty-six varieties, but it would have puzzled you, Mr. Secretary, to have named them. The next orchard I bought were two hundred trees—Winesap, Ben Davis and Willow Twig. I bought them from a wild-cat nurseryman, and gave a note that by some mysterious means drifted into the hands of an "innocent purchaser," and when the trees came, they were dead. I think only four started. But this purchase saved me a dentist bill, so I have never stopped to whine about it. My third orchard of four hundred trees struck me at that time of life when I found out that I had bitten off more than I could masticate, and do it well. And it is needless to say that this orchard, while it bears many and good apples, I am not proud of it as I expect to be of an orchard of five hundred Jonathans set out the past spring. And now a few words as to varieties, and I will pass on. My observation teaches me to believe that Ben Davis, while a good apple in many respects, it has too much fiber, its quality is too poor, and altogether too coarse to stand the demands that will be made on the apple of the future. Being unavoidably detained in Chicago for several weeks this fall, I spent considerable time on South Water street. And in talking with the commission men, I was led to

conclude that Jonathan is the coming stard apple. By early September picking and prompt cold storage, it can be made a February apple. And I was repeatedly assured that the coming February would find cold-stored Jonathan selling for \$5 per barrel. Bearing my theory then on past experience and observation, Mr. Secretary, if I were going to plant 1,000 trees for profit, I would plant 500 Jonathan, 200 York Imperial, 200 Gano, 99 Winesaps and one Ben Davis.

Now, we take up blackberries. After a few years' trial with Lawton, Kittatinny and others, only to find them rust and winter-kill, we discarded them entirely, and about eight years ago we purchased the first 1,000 Snyder's that ever came into our neighborhood. We had a high-laying four-acre piece of new, dark rich hazel-brush land. We planted the 1,000 on one side; the next season propagated from root-cuttings enough to set the whole four-acres, and from that piece of land we have realized more cash in the last six years than from any venture we have ever made. But we think the day of profit in Snyders is over, because they are so nearly spontaneous in their growth, requiring but little attention, that every one will soon have an abundance. The lines of profit for the future horticulturist will be along less beaten paths, where more knowledge and more pains will be called into requisition.

Raspberries have been profitable, and we find that two or three rows run through between young apple-trees prove congenial companions (only black caps, as the red varieties are death to apple trees), and pay well for the cultivation of an orchard until it begins to bear, when they should be removed and clover take their place. Souhegan, Gregg, Ohio, Hopkins, Shafer's Colossal, are now growing on our place, and stand in the order named. The Shafer is a hybrid, and of the red we grow nothing but the delicious little Turner, and we grow that rather to cater to the wants of our numerous customers than as a means of revenue. We recommend thorough clean culture of everything at all times, but among all the fruits, none feel neglect quicker than the Black Cap raspberry.

Grapes we never have planted but two acres of, and they were all Concords, and for four years past they have rotted, till they are a decided nuisance. But one of my neighbors treated a vineyard that had been behaving the same way to a good dose of Bordeaux mixture with wonderful results. Grapes have been a comparative profitless crop for three years past, except to those who were fortunate enough to have Moore's Early, who did quite well.

Peaches come in next for our consideration, and our experience with them has been almost as varied as our strawberry experience. We bought 700 trees of a famous seedling variety, and planted them about twelve years ago; cultivated them well for eight years, and two years ago we grubbed out the last one, never having received one single peach from them.

Two years after setting the above orchard, I had a ten-acre field laying high and favorable, so I followed it and laid it off so that it would hold just 1,000 trees. I hired a man to dig holes and haul manure into them, and altogether had been at an expense of about \$75. I planted my pits about two inches deep in the fall, and by spring I had my holes all ready. As soon as I discovered them bursting the pits I removed them carefully and planted them in the well-prepared holes, putting two in a place and sticking a stick between them; being busy, I didn't go back for a week; when I did, I discovered that the mice had come in from the woods and taken up every pit but four; so I paid \$75 to learn that mice would eat peach-pits. But I have continued to plant a few along, and whenever we strike a season, I have plenty of peaches.

Pears have never received much attention; we planted one orchard of 75 trees some years ago, then manured heavily and planted strawberries between, only to learn dearly that strawberries and pears, like lions and lambs, don't belong together. Blight has taken all but six. However, our observation traces this plant on high thin soil; cultivates well for one or two years, then sow in blue-grass and let them go, with an occasional trimming.

And now, Mr. Secretary, while we have only touched on the staple fruits, and while in our dull way we might say much more, we feel a kindly regard for your patience, which bids us desist.

And, if we have fallen short of your expectation, you must not lose sight of the fact that the subject was too large for the man you laid it upon.

Yours truly,

J. T. MIDER.

WHAT SHALL THE IDEAL HORTICULTURIST DRINK?

Our ideal horticulturist does not drink intoxicating liquors, be it hard cider or any of the numerous drinks obtainable at saloons.

Upon a few occasions, when I have had an opportunity to see the men who passed into a saloon door on Ohio street, in about ten minutes a dozen or more, apparently farmers, obeyed the instructions on the door to "push."

Perhaps they went to sell potatoes or apples. Usually we go to the dry-goods store for dry-goods, grocery for tea, coffee, etc., so our inference in this case is simply a natural one when we assume that these men went to drink.

I thought, oh, the pity of it! Men who have indeed to earn their bread by the sweat of their brow, who have to wage constant warfare against the thorns and thistles that spring up to destroy the good grain, spending their hard-earned money for that which does not profit the body and may ruin the immortal soul!

I can only regret that every man here had not the opportunity of hearing Mr. Murphy, who was with us a short time since—not only of hearing, but of acting upon his advice and wise counsel to the extent of signing the pledge and putting on the blue ribbon badge.

How clearly he pointed to the fact that alcohol in any form and in any quantity is injurious—that while you may be pleased to say that you can take a drink or two with a friend and not feel it, as it takes ten or a dozen to make you drunk, yet after the second drink you are one-fifth drunk—the same kind, but in less degree only.

Alcohol is not found in nature, only in decaying substances, either carrion or decayed vegetable matter, and is an enemy to the human organism from every point, there being no particle of nutriment, but only that which destroys nervous and muscular tissue.

Athletes who are the most successful in competing for honors are men who are total abstainers. The rowing teams of Yale and Harvard, and many of the celebrated base ball clubs, will allow no man among their number who is not a total abstinence man. As you know, many insurance companies will insure only such men, while others give special rates to those who do not drink. These things must have their weight with all who think: it means that men who use no intoxicating drinks are more fully in command of themselves—that men who do not drink are more likely to live than those who do.

Our Creator made man upright, the only being to which he gave speech and reason—the only thing of which he said, "let us make him in our image"—and this being created upright means more than to stand twixt heaven and earth on two feet.

it means to be upright in dealing with our fellow men; living the rule which was called Golden, given us by the man of Nazereth, who said, "whatsoever ye would that men should do to you, do ye even so to them;" and nothing so much as the use of intoxicating drinks prevents this precept being carried into action.

Solomon, said "the love of money is the root of all evil," but in these days it would seem that the love for intoxicating drinks might share the curse.

As I look at these men I would fain think this an unnecessary topic for discussion; but the subject was given me by wiser heads than mine, so I suppose there is need for it.

We try to discover the cause for this evil of intemperance, and see that it is due largely to ignorance, discontent and public opinion.

Ignorance which will permit any mother to flavor puddings and mince pies with brandy or whisky is an ignorance which is criminal.

"Lack flavor," you say; then don't let us eat mince pies if they must needs have flavor of the saloon, for that very flavor is what we should have our children avoid as we would the small-pox or cholera. In after years, if tempted to try a glass of liquor (which, to the normal taste, would be repugnant), this appetite which, in childhood and youth, has been cultivated through the products of the home kitchen, bursts into a full-fledged desire, whose cravings are satisfied only by the drinks that are handed over the counter.

And the mother waits anxiously and with heart yearnings for the boy who has gone to town, knowing his weakness, and never dreaming that she helped to cause his downfall.

In this day and age of the world there is no excuse for lack of knowledge in regard to the effect of intoxicants; every father and mother should instil it as some of the earliest lessons of childhood, and every teacher should feel it a solemn duty to instruct the children as to the awful dangers of this "beverage of hell," which "biteth like a serpent and stingeth like an adder." Teach them that it may appear beautiful; that its momentary effects may be conviviality and good fellowship, but that in reality 'tis a monster, whose power can change the kind husband and father into a very demon; whose sway can convert a dutiful, loving, manly son into a disrespectful reeling sot.

I cannot but believe that these things, if taught our children, will have their effect; other instruction tells for life, why not this?

If a boy is taught to loathe whisky, tobacco and evil companions, think you he will be loafing around saloons and on street corners, smoking cigarettes, as we see them in our own town, even at seven or eight years of age?

We are largely what we are made during the first ten or twelve years of life; we are likely to love and hate what we are taught to love and hate during this impressionable time.

No one realizes this more than the members of the great Catholic church; their children are trained in the faith, and are Catholics in childhood, and, as a rule, remain such for life. We Protestants are too apt to let them grow up outside the church, with the vain hope of drawing them in, one by one, in after years.

Let us teach our children that the body is the visible expression of the soul, the necessary habitation of the spirit—as we Christians believe, the temple of the Holy Ghost.

Teach your children the use of their bodies. Don't, I beseech you, mothers, send your children to school or onto the streets to learn these things, where their instructors will doubtless be children who are not only ignorant, but, perhaps, vicious and demoralized.

Teach your children to observe and think ; a large majority of people never use their brains—seem vitally opposed to thinking. Moving in ruts, and doing the same things that other people have done, as a matter, of course, without any reasoning, isn't living in the true sense ; it's vegetating.

If your boy is taught to observe and *think*, he's very apt to observe that the men who drink are the men whose orchards and farms are neglected and mortgaged ; whose animals are illy kept and badly treated ; whose wife, from necessity, wears for many years the same threadbare shawl and faded bonnet as an accompaniment to her sad face and faded hopes, and whose children are *nobodies*.

If he is taught to think, he will look ahead to the end ; he will not drink simply because the men who helped at the harvesting have their jug of whisky and seem to enjoy the indulgence, but he will recall that Dr. Thompson has lost many of his best patients because he drank ; that his former friend and schoolmate has become a perfect tramp, unable to find employment, because he drank ; that the neighbor across the field was thrown from his horse and nearly killed while returning from the Fourth of July celebration, because he drank. And, last, that God has said, "no drunkard shall enter the kingdom of heaven."

The horticulturist who thinks of these things will not consider an invitation to drink necessary to sociability when he meets a friend in town ; nor will he feel obliged to "treat" the men who assist at the raising of his barn and at the threshing.

The contents of all these jugs are purchased in town at great expense. We would think the farmer who bought all his meat, potatoes, etc., at the grocery stores a poor manager, indeed not fit to be a farmer. No, he must produce his own food, why not his drink ? He has grapes, strawberries, raspberries and blackberries that can at slight expense be converted into drinks fit for the gods—raspberry shrub, which is becoming very popular in both country and town, unfermented grape wine, which is most nutritious and refreshing, and other preparations that are warranted to interfere in no degree with a man being healthy, wealthy and wise. (Can the same be said of the intoxicating drinks which ruin health, dissipate wealth and injure the mental faculties ?)

Drinks that can be handed to wife and children with the same freedom that you would give them a glass of water. (Would you be willing to see your wife or that boy or girl, the pride of your life, walk into the saloon and toss off the drinks that you swallow in front of the counter ?)

Treat your friend to raspberry shrub, and if for sake of Auld Lang Syne you desire to touch glasses and drink his health, do so again and again if you choose, and feel sure that no carriage will have to be called to get you home, and if you are a young man you will not be taken to a neighbor's house to sleep off the stupor, that your mother may not know you were drunk.

[I have copies of a few receipts, that while they would not be very interesting here, would be of both interest and profit in a practical way to any who may not have them, and I hope you may each take a copy.]

Again, discontent enters a man's life ; he doesn't coin money fast enough, so he drinks and squanders what little he does make. He has family infelicity, so drinks and thereby shuts out all possibility of ever again having peace and happiness ; his wife or child dies and he drinks to drown his sorrow, and by so doing places a greater barrier between the loved one and himself in the next world than death has placed in this.

The boy or young man feels that he don't amount to anything, that nobody cares for him ; he is discontented and drinks. Yes, many boys in the home of

father and mother actually feel that nobody cares for them. Why should they not? The father is so busy trying to reach the point when he will be worth two, five or twenty-five thousand dollars (according to his idea of what amount will produce happiness) that he has no time to bestow upon the boy; mother, too, is so absorbed with her duties and looking forward to the time when they will be "able to enjoy life" that she has no time for commendation and kind words, and, of course, not for caresses. How much we lose by living in the future instead of the present.

If we knew the pain and heart-ache waiting for us down the road,
If our lips could taste the wormwood, if our backs could feel the load,
Would we spend the day in wishing for a time that ne'er may be?
Would we wait with such impatience for our ships to come from sea?

If we hope to sometime have a happy home, one we and our children shall enjoy, let us have it now; we have no lease upon to-morrow.

Pardon this digression, but if we have sympathy and love and caresses for the little tots who have no heart-aches, excepting over a broken toy or mashed nose should we not much more for the boys and girls of ten to sixteen who have genuine troubles and heart-aches; and if in our homes we have no place for the entertainment and pleasure of our children—if our parlors and sitting-rooms are so nice that we are afraid to have them used—we need not be surprised when our boys are attracted by the bright and pleasant rooms of the saloon, which are not too good for their use.

Again, public opinion is much to blame, for the fact that the largest bill paid by these United States is the whisky bill.

We have heard much in these days about the drunkards and drinking men all being at heart good, kind, noble fellows. If a woman is excused for expressing an opinion differing from the general one, let me say that the man who uses his money and good-heartedness all in the saloon, going home to his neglected wife and children to bestow upon these, whom he has sworn to love and protect, nothing but curses and blows, is a villain.

We lock up our murderers and shoot the horse-thieves, but if we would turn all these out and lock up the drinking men, this world would be smiling with happiness and plenty, compared to what it now is.

In the great Christian Endeavor conventions which met last year in St. Louis with eight thousand delegates, and this year in Minneapolis with twelve thousand, the people were amazed that so large a number could be gathered and bring prosperity to every line of trade, excepting the saloons; and may we not hope that of this convention of horticulturists whom we are so glad to welcome to our midst, not one will darken the doors of a saloon, nor call for a drink of intoxicating liquor in any place.

Let the people be impressed with the fact that not only are our horticulturists and farmers men, but that they are gentlemen.

We women blush with shame as we think of the men, the ones whom God has ordained the head of the family, the ones who govern the Nation, the ones upon whom we rely in sickness and in health, in sorrow and in joy, the Lords of Creation! taking that into their stomachs which "steals away their brains"—doing that which in us they would not countenance for one moment. In the name of those who love and trust you, in the name of womankind, don't!

The greatest evil of our day is conceded by all to be intemperance; 'tis the giant that like Goliath of old stalks back and forth defying the armies of the living God; and the pebble which is able to pierce his coat of mail is the stone of public opinion, hurled by the hand of men and women.

As long as our young women receive the attentions and marry drinking men, just so long will our boys of 16 to 22 think it smart to be wild and *blase*. When the time comes that public opinion will say to the drinking man, as it says to the dishonest, or any other disreputable class, "you have closed the door between us, and you are on the outside;" then will the day dawn when Iowa's glorious motto shall be not only a motto but a reality in every one of the sisterhood of these glorious United States.

God speed the day when it shall be written in letters of light on every public building, and the result shine forth from the face of every man, woman and child: "A school-house on every hill-top and no saloon in the valley."

MRS. E. P. BOLLER, Sedalia.

RASPBERRY SHRUB.

One gallon fresh berries; pour upon them one gallon pure cider vinegar; let stand twenty-four hours and press out into a vessel, adding a second gallon of berries; after twenty-four hours press and add a third gallon—treat as before. Now, after pressing the juice, add one and one-fourth pounds white sugar to each pint of juice; place over a brisk fire and boil fifteen minutes only, when it is ready for jugs or bottles. It need not be sealed, as it will not spoil. For drinking, a few teaspoonfuls in a glass, with water and ice to taste.

GRAPE JUICE.

Cook grapes as for jelly, adding to the juice one pint of sugar for every pint of liquid; bottle and seal till wanted. Use as above.

BLACKBERRY VINEGAR.

Put berries in a stone jar, mash thoroughly and cover with pure cider vinegar. Stand in the sun all day and in cellar at night; stir occasionally. In the morning strain and add a second quantity of mashed berries, standing in the sun as before. Strain next morning and add to each quart of juice one pint of water. To every three pints of water and juice add five pounds white sugar; boil and skim; bottle while hot and seal. Three tablespoonfuls to a glass of water.

STRAWBERRY ACID.

Pour one quart good cider vinegar over three quarts of berries; let stand twenty-four hours and strain; put the juice on a second three quarts of berries; after twenty-four hours strain again and add one full pint of sugar to every pint of juice. Boil slowly ten minutes, skimming off impurities that rise. Bottle when cold. For a drink, add two or three spoonfuls to a glass of cold water.

"POOR OLD MISSOURI."

As an all-around horticultural State, I am proud to be able to say that the great State of Missouri in natural advantages stands far ahead of any state in the Union, and it rests with our own people to determine whether or not they will reap the rich rewards that only await their intelligent and industrious development, which means a concert of action, consultation, the adoption and thorough application of the most practical methods of cultivation, harvesting and marketing your products, as well as securing favorable transportation facilities and rates that will enable you to place them upon the best markets at a price that will meet competition from other producing points and make sales at remunerative prices.

While some states may be able to boast of their immense yield of apples, others of their great acreage of peaches, pears, plums, quinces, grapes or berries, our State produces all these different varieties of fruits to as great or greater perfection than any other, and with proper development will produce each or all of them in quantity and quality that will astonish the world, and bring those seeking fine goods to our doors, opening up a home market for our products, which is always the best and most remunerative.

The mountain districts of the southern and western portions of the State produce apples of immense size, high color and excellent flavor, and the northern counties yield largely of a fruit which, while not quite equal in size to that produced farther south, has no superior in color and keeping qualities; and a failure to produce a fair crop in any part of the State would astonish the oldest inhabitant, who, when asked when such a thing had occurred, would reply, "you must ask some one older than myself."

The natural home of the peach is the Ozark range of mountains, where a failure seldom occurs, and the fruit is unsurpassed for size and quality; while the gravelly soil found in almost all the mountainous regions produces an article of pear that will compete with California or any other state in an exhibition, and seldom fails to get the premiums, besides being less subject to blight than in any section of the country that has come under my observation.

The plum, quince, cherry, blackberry, raspberry, currant, gooseberry and other varieties of fruit yield bountifully of first-class goods in almost every county, while immense fields of strawberries are to be seen in various sections, not only in St. Louis county, whose berries are known and sought after from all consuming points within reach, but in the southeastern, southern and western portions of the State, from each of which localities many car-loads are annually sent to a very profitable market.

While we cannot boast of the vast number of acres of grapes produced in the regions adjoining the great northern lakes, several sections of our State furnish a bountiful yield of magnificent bunches and large-sized berries, of the most palatable flavor, which always find ready sale at the highest market price.

Then, "Oh! dat watermelon!" of which there are annually shipped from two counties in the southeastern part of the State from two to three thousand cars of an article whose reputation is equal to that of the famous Georgia product, and for which there is a demand that brings buyers to the shipping stations who eagerly take all the good stock offered, at a price that pays the producer three or four times the amount per acre realized from any other field crop he can produce.

With all these advantages, it is not to be wondered at that those who grasped the idea in its infancy, and carried it out intelligently, are now able to build comfortable homes, ride in carriages, surround themselves with luxuries that are beyond the reach of those who confine themselves to the ordinary products of the soil, and instead of having their lands encumbered with mortgages, almost always have a few dollars to lend to their less fortunate neighbors.

Although nature has provided us with all of these advantages, these results are not produced without the use of brain and muscle, and he who would achieve success must do so by the sweat of the brow, and strict attention to business.

He must first learn by experiment or consultation with those who have been successful in his line.—What varieties to plant, how to cultivate to produce the best results—and then *do it* with all his might, leaving nothing undone that will advance his interests, and not expect nature to do for him what he has neglected to do for himself.

He must not only introduce intelligence and industry into his business, but he must practice strict integrity in his dealings, so that when a package of his goods appears upon the market, people may *know* that his brand covers honestly packed goods and full sized packages, for which they are always willing to pay the highest price.

There is a brilliant future ahead for "poor old Missouri," and many of you who are present to-day will live to see her the key-stone of the horticultural arch.

E. T. HOLLISTER, St. Louis.

PRE-HISTORIC: OR, SOME THINGS FOUND IN THE GROUND.

From the above heading, one could scarcely guess what the following article would be, for it contains an ambiguity giving a wide scope for choice of a great variety of subjects or lines of thought, so that we might strictly adhere to our text and write a score of papers with little or no relation between them. For example, we might take the composition of the soil or ground and submit it to a critical analysis, and write out what we found in the ground. Or, regarding the ground as in its simple, component parts, free from the mixture of any foreign elements such as decomposed vegetable and animal matter, we might then come forward with our paper descriptive of such matters found mingling with the virgin mineral ground. Further, our paper might legitimately, and in such a meeting as this, appropriately, dwell upon the roots and fibers of trees found in the ground, clinging to the earth, hiding in the soil as the medium to sustain vegetable life, while the trees and vines themselves gather from the air the invisible and non-apparent ingredients, and in the proper proportions assimilate and materialize into the luscious pear, delicious peach and palatable apple, with all their rich flavors and varied and brilliant colors; and thus we might meander through all the numerous varieties throughout all the vast domains of horticulture. Or we might grasp the hoe and dig from the ground the tubers of the vegetable kingdom, and again write extensively of what we found in the ground. Again, we might take a subject of equal importance to all who are sufficiently interested to honor this meeting with their presence, and write of what we found in the ground in the way of impoverishing or fertilizing crops—the rye, with its wiry leaf, stock and underground, soil-exhausting fibers, or the Canadian pea, with its extensive, mellowing, fatty, bulbous roots and broad leaf, gathering from the air fertilizing elements and depositing in the ground for its successor a hundred-fold more than the ground gives to it.

But does our mind run along the line of the antiquarian, the archæologist, or are we searching out or writing up the history of the pre-historic races? then our paper will bring forth from the ground things new and old, and we shall grow fluent over the decaying remains of the perished races, from the mounds, pyramids and the unassuming common ground we shall in ecstasy gather the buried records, inscriptions, utensils, implements, etc.

Then let this paper digress from the exclusively horticultural line of thought of this gathering, and pursue this line of investigation of the numerous good things found in the ground.

We, in our short and limited investigations among the relics of the pre-historic and vanished races, have discovered sufficient evidence to demonstrate some very important facts placing these ancient races in a more favorable light as to their intelligence and morality. When all these facts and evidences are brought to the public, it will afford the reading world increased pleasure in looking back to a ripe, healthful and progressive moral and mental culture, adapted to the well-being of these varied nations, instead of as heretofore looking backward into heathen degradation, infantile intellect and disgusting barbarity.

We have found in the ground sufficient data and evidence to force us to infer and make us feel safe in the inference that in the distant past, with many thousand years' intervening, our predecessors on this free America, which we now call ours, gathered in just such meetings as this to discuss just such subjects as those under consideration to-day. And we certainly wrongly read those records found in the ground and duplicated by the lingering traditions of our immediate predecessors, if these lost races had not arrived at a higher state of civilization and progress along many of the lines of invention than we have yet attained. Their records of history carry us back to the remotest time, long ante-dating all other records of profane history, and give a chronology more in harmony with the findings of modern science than the hitherto supposed chronology of the Sacred writings.

From some things found in the ground we are again forced to the inference that their astronomical attainments were infinitely superior to all the combined knowledge on the subject of all the nations of the world to-day. The necessity for brevity in this paper prohibits examples or proof, but we venture to instance one point. We are indebted to the retrograded and depleted distant descendants of these grand ancients for the correct length of the year. The Anglo-Saxon race and the European nations were ordering the times and seasons of the year by the Julian calendar, but the Aztecs taught us our error of ten days' time in the reckoning and gave the supposed more enlightened races the correct length of the year.

But we must leave these broader subjects and come down to the more minute and particular. When but a boy, plowing on my father's farm in the Ottawa Valley, Dominion of Canada, I turned up from the ground multitudes of the bones of these vanished races—bones of the giants, for there were giants in the land in those ancient days—bones of the Pukweges or Pigmies, and bones of the so-called Mound-builders, together with their racial emblems and several distinctive implements and weapons, among which were copper tools welded and tempered as steel; this was an art of the ancients not attained to by us. On Chimney Islands in the St. Lawrence river, are the chimneys made of stone cemented together by a process and composition, and with materials now unknown to the world. The paints by which their records and history were written on the Laurentian rocks on Lake Superior, and in fact all over this America, the material imperishable, is now beyond the kin of our boasted superiority. These pictographs and tracings of petroglyphs are still plain and brilliant having defied the destructive elements and the crumbling hand of time in their unceasing efforts through ages and epochs to obliterate them. Many of these must have lain in the ground for many thousands years. Take for example, my tablet found in the ground near Thayer, this State. There are clear evidences that it must have lain there since the year 397 A. D. Take the painted jars of pottery found in the mounds near Marked Tree, Ark., thousands of years must have passed since they were placed there, for the human bones of far more recent burial show greater signs of decay than bones of persons known to have been buried in England before the beginning of the Christian era, and all readily concede the fact that the land and other circumstances here are more conducive to their preservation than the conditions in England.

Then here is this burial ground where the decayed dust of hundreds of millions mingles with its mother earth, we read of intelligence, virtue and antiquity not dreamed of by the multitude, and even not hinted at by many otherwise wise antiquarians. There is there one pre-historic cemetery, containing about ten acres and on an average over six feet deep, one solid mass of decayed human remains and pottery, for with each body a piece of pottery was buried. Here also in a cov-

ered jar was found this pre-historic corn in a grave fifteen feet under ground. It is unlike any corn now known. One year I raised a stalk fifteen feet tall, ten feet five inches from tip to tip of the leaves, and it had eleven shoots for ears; a storm blew it down and they all did not ripen.

The tablet I found in the ground in the Indian Territory confirms the whole theory and verifies the truthfulness of the traditions, if not their inspiration. Here we have the more important figure. Will you have the tradition referring to it?

The Nampa image found in Idaho reveals secrets from the antiquated past. Relative to this the concluding remarks in the "Scientific American" of September, 1889, are:

In boring a well 320 feet deep beneath the surface, beneath the following layers were: First, 60 feet of soil, 12 to 15 feet of lava rock, 100 feet of quicksand, 6 inches of clay, 40 feet of quicksand, 6 feet of clay, 30 feet of quicksand, 12 to 15 feet of clay, then clay-balls mixed with sand, then coarse sand, in which the image came up, then vegetable soil, then the original sand-stone.

Mr. S. F. Emmonds, of the U. S. Geological Survey, expresses his opinion of the extreme antiquity of the image and bearing signs of fine artistic skill, being, according to the testimony of Prof. Putnam, of Cambridge, and Prof. Haynes, of Boston, carved from a light pumice-stone and a coating of red material enveloping it, thus showing the skill of those ancient races; while his decisions are in a line with those discoveries made by Prof. Whitney, in California.

Prof. G. F. Wright, of Oberlin, Ohio, concludes as follows: The discovery of so good a specimen of art as this Nampa image is adds weight to the evidence which Mr. Whitney has presented, and supports his theory and that of Prof. Putnam that the human race was much farther developed on the Pacific slope in the earliest times than it was on the Atlantic coast or in Europe; and the discovery will bear with strong weight against those who assume an unvarying and gradual evolution of the human species. It points rather to the degeneration of certain races. Orthodox theologians would be inclined to regard the image as a relic of antediluvian art.

In Obispo county, Southern California, a great rock rises 150 feet above the plain Carissa; on its eastern side there is an opening 25 feet broad which leads into an inner temple, or court, with level floor 225 feet by 125 feet. The ceiling is from 60 to 100 feet high. On the walls are paintings in red, white and black, doubtless having an important meaning. The colors are apparently as bright as when laid on. In the hundred years since its discovery there has been no change in its appearance.

A report comes from New Mexico that near Albuquerque, the discovery has been made of an ancient smelting furnace filled with ore. Not far off a bar of smelted silver was found. The furnace was five feet high and three feet square, and was so built that heat could be evenly distributed to every part by a system of pipes.

In Colorado, near Red Cliff, pre-historic relics were discovered by miners in a cave that had been the place of sepulture of a primitive American race, and had been closed for ages. The petrified bones of beasts and human beings were found 400 feet beneath the surface. Among the relics was a knife of hardened copper, 12 inches long, with an oval handle. In the Iron mountain, Michigan, not long since, the miners came across a pre-historic mine 300 feet underground, and this mine had been worked by tools of hardened copper.

In the mining region of Lake Superior, in an excavation of thirty feet, eighteen feet below the surface was discovered a mass of native copper ten feet long, three feet wide and two feet thick, weighing over six tons. This had been raised and moved some distance, and lay on a cob-work of oak logs which had been cut with sharp axes. The ancient tools removed from this lode exceeded ten cart-loads. Here these ancients mined copper from veins which, were they consecutive, would

reach over 200 miles, and which were of varying thickness. Not only at Keweenaw Point and other places on the mainland, but on Isle Royale, there are extensive pre-historic mines. The whole, as far as discovered, exceeds all the works of modern operations: that is, we have not yet approached to the skill and gigantic scale of their mining. A peculiarity of this copper distinguishes it from copper of all other mines in the now known mining regions. Yet copper implements with this distinguishing exhibit have been discovered abundantly in the Ottawa valley, Dominion of Canada, in Wisconsin, Minnesota, Illinois, Ohio, New York, Mexico, Peru, Ireland, Switzerland, and, in fact, nearly all over the known world; and we have no doubt, could fragments of bronze (brass) from among the cargoes shipped from America by Hiram aid in the building of the temple of Solomon be discovered, it would bear the distinguishing mark and verify the assumption we make that South America was the land of Ophir.

That copper musical instrument found in Illinois last year goes far to link this land with Tubal Cain and Jubal, while the traditions and tablets unmistakably locate this as the home of their sister, Naamah.

But not only did these ancients mine copper, silver and gold, and fully master the more difficult arts of reducing them from their ores to the pure metals, and the more difficult matter of mining tin, reducing it, and in the proper proportions forming an amalgamation resulting in the production of bronze, but we find in the ground evidences that they understood the less difficult matter of mining, smelting and utilizing the more useful iron. One of the oldest traditions of the Ojibwa tribe of Indians unmistakably refers to the use of an iron pot owned by a Magi of the more ancient race, their predecessors, located in Colorado at the time of the origin of their own race.

In Kansas, five miles from Cherryvale, a Mr. Smith found a foot of a child with a shoe on, all were petrified. It was dug from under four feet of sandstone. The nails in the heel of the shoe were plainly apparent.

Tools of hematite have been found in many of the mines. Some of their telescopes are made of the same material. In the pre-historic cabinet of the Wisconsin Historical society there is an implement of unalloyed copper with a rivet of iron. In a tomb in Shelby county, Ohio, built of finely finished rock, everything of a perishable nature was dissolved to dust except a piece of silver and a steel chain, the latter without a particle of rust. A man in Salem, Ohio, in preparing a piece of rock for a mill-stone, after removing three inches of its solid surface came to holes which had been made in it by art. He there found two iron wedges, one of which had thin strips of iron on each side of it. Where I live hematite utensils have been found.

But time forbids us to enumerate further examples on this line. Concession is now freely made that ancient Chaldea was the parent land of astronomy in the so-called Old World. This conclusion is arrived at from the perusal of a book compiled 2,000 years B. C. The Babylonians catalogued the stars, distinguished and named the constellations, invented the sun-dial to mark the movements of the heavenly bodies, the water-clock to measure time, and they speak in this work of the spots on the sun and the rising of Venus. The conclusion is that they must have known the use of the telescope.

But if the combined discoveries in this land prove this to be the older world, then America must be regarded as the fatherland, not only of astronomy, but of letters and civilization.

The reports of the explorers from the state of Chiapas, Mexico, savor strongly of a ripe civilization in this land of an unprepared-for antiquity.

The discovery has been made of a broad paved road from Tonalá down into Guatemala, and thence in a curve up again into Mexico, terminating at Palenque; again from Palenque it crosses Yucatan to the island of Cosumel, and is continued on the island. Along parts of this road the ruins are of great magnitude. Houses four and five stories high are abundant, and covered in the depths of the forest. Many of these houses are pyramidal in form, and so covered with vegetable mould that large trees are growing from the roofs. In some of these buildings, use is made of tremendous stone beams, approximating to one hundred tons in weight, and the architecture indicates a high degree of science. The transportation of the stones for these structures of such gigantic proportions from forty-five miles distant, over mountains, across ravines and rivers, and the placing of them in position, would baffle the skill of our boasted to-day. Competent engineers have estimated that the building of these roads would require more engineering skill, more labor and means than it took to build the two Pacific railroads.

Pending from the ceilings are their massive and artistic lamps of bronze, and the interior and exterior decorations consist of panelings, elaborately carved figures, nearly life size, of the distinctive races; while many sculptured figures—doubtless representations of their sainted dead—show taste and culture, and the undeciphered hieroglyphical records remain yet among the things of the incomprehensible distant past. All proclaim a hoary antiquity, a densely populous nation of a high state of culture and refinement, and skilled in the arts and sciences.

Thousands of miles of just such roads as those of Mexico were found in Peru. Humboldt pronounced these Peruvian roads "among the most useful and stupendous works ever executed by man." Donnelley says, "they built aqueducts for purposes of irrigation, some of them five hundred miles long."

The pyramid of Cholula, Mexico, is the largest known in the world, and shows signs of as great antiquity as any other. The measurement given by Humboldt is that it covers forty-five acres. The largest in Egypt (Cheops) covers a little over twelve acres, and the structure at Teotihuacan covers eleven acres, and the points of similarity are such as to lead to the conclusion that one is the imitation of the other. The tower of Babel covered forty-two acres, and was built of the same material as the large pyramid in Mexico.

Herodotus tells us that the Pyramids were introduced into Egypt by the Hyksos. Proclus says they were derived from Chaldea. Now, had we time we think we could prove that both the Chaldeans and the Hyksos came from America, but we must pass by our own pyramids in California, Mississippi valley, Central America and South America, even the places where over two hundred can be seen at one glance. The estimate of the time of the building of the most ancient in Egypt is placed 5,000 years ago; the remains, mummies, etc., in those in this land show signs of much greater antiquity than those in Egypt. Similarity in both hemispheres is very striking in all the ancient customs. The description of Herodotus of the burial of a Scythian king duplicates the American mound. Homer describes the erection of a mound over Achilles, also one over Hector. Alexander the Great buried Hephæstion in like manner at a cost of over a million dollars. Semiramis buried her husband in the same way.

The grave-cists, made of stone in the American mounds, are duplicated in the stone chests for the dead in the British mounds and those in Switzerland. The wooden coffins of Yorkshire are duplicates of those in the Mississippi valley. The vases in the graves in Arkansas and elsewhere are duplicated by those of Chaldea and Egypt. We trace the same parallel in the cement, bricks, ornaments, metals, sculptures, paintings, engravings, agriculture, public works, navigation, manufactures, weapons, religion, government, social customs and language.

In this country these are universally distributed, while on the other hemisphere some of these particular traits appear only in each particular locality; hence the reasonable conclusion that this is the parent land.

Now for one more example of antiquity. Prof. Agassiz tells us that geology finds its oldest landmarks here. Sir Charles Lyell concludes that the Mississippi river has been running in its bed for more than 100,000 years. This assumption is arrived at from the fact that for about 300 miles of the delta there are ten distinct forest growths of large trees, one over the other, with interspaces of sand between; these must have succeeded each other. An estimation was made for the growth of two of these consecutive growths, amounting to 11,400 years. In the excavation at the gas-works, sixteen feet below the surface, burnt wood was discovered, and also the skeleton of a man; the cranium lay beneath the roots of a cypress belonging to the fourth forest level below the surface. This would give us 22,800 years beyond the beginning of our own era. Here, then, is hoary antiquity compared with the Egyptian record. From the "Scientific American" we gather that "On the Isle of Petit Ause, Southwestern Louisiana, 125 miles west from New Orleans, on top of the bed of crystal salt, are found the remains of the mastodon, mammoth sloth, horse, tusks and bones, intermixed with ancient human relics such as arrow heads, spear points, tomahawk heads, paint pots, mortar and pestle, and pottery of all kinds. The earth covering the salt ranges from ten to twenty-three feet in depth, one hill rising to 183 feet. Over the salt come pink and yellow clay-beds, over this a pink sandstone quite decomposed, then a layer of coal thirteen to seventeen feet thick, then the surface clay. The showing is that the salt formation is the first and older formation, and that the animal and human remains are older than the clay, stone and coal.

From all the combined testimony of all the discoveries hitherto made on all the continents, among all the races of earth and in all the lines of investigation, the almost universal verdict is that this is the Old World. Geologically, philologically, archæologically and ethnologically this is the Old World, and the most hoary locks of antiquity venerate our continent in every respect as the most ancient of all the world.

Now, from the identity of the civilizations, the varied structures and constructions and all the possible lines of evidence, in all the universal fields of investigation, so strong and manifest are the evidences of similarity traceable, that the natural conclusion is that all had one common origin.

Now turn the vast streams of emigration from this, the Old World, the veritable land of Nod, to Europe, Asia and Africa, the newer world, and we solve ninety-nine out of every hundred of all the vexed problems now and otherwise inexplicable by all the varied investigators. We can account for all the unaccountable in history and discovery.

The reasonableness and practicability of large colonies passing from this older world to people the so-called Old World must be easily manifest if we are logically consistent with the facts existing, and honestly view and weigh the statements of the traditions.

Our meaning will be made clearer by examples: If Hiram, king of Phenicia—one of the younger colonies of this land—in the reign of Solomon, was capable of constructing sea vessels of sufficient capacity to traverse the great Pacific and Atlantic (for they sailed both by way of the Mediterranean sea, passing the pillars of Hercules, and the Persian gulf) in voyages of three years' duration, then the parent nation was likely to possess equal if not superior equipping and sea-faring skill.

Read the authenticated descriptions of the temples of Mexico and Peru, in their architectural splendors, gorgeous magnitudes, unparalleled golden wealth and transcendent beauty. Regard their superior skill in the working of metals, the engineering and mechanical skill necessary in the construction of the roads and other numerous works of magnitude, and all the more difficult work discovered, then, if you dare, risk your reputation and assert that they did not possess the lesser skill and capacity to erect vessels and traverse the oceans. Logical consistency demands this concession.

These admissions being made, we are then on the high road to gather the accumulated evidences to demonstrate important facts essential to truth along many important lines. Then we shall forever exode the most untenable and imbecillious of all theories: that is, that there ever existed a "stone age," representing the infantile and barbarous stage of the human family, and from which the race gradually evolved to our present most superior civilization. All the evidences converge to prove evolution in this respect reversed, loudly declaring retrogression the former tendency.

Thus from the supposed longevity of the ante-diluvians, we mark the retrograde tendency in man's physical tenacity and powers, and from numerous evidences of intellectual superiority long antedating the deluge, and from the presence of these stone implements representing the fabulous "stone age" profusely strewn over the surface; while deep under the ground, beneath sandstone, coal and lava rock, are marks of ripe civilization and cities of the skilled architect, evincing mental and moral culture worthy of the envy of our day.

Hence, we authoritatively conclude that the Biblical account of the perfection of the whole man Adam at creation is the correct account. Adam, the beginning of the human race, was a perfect human being, physically, intellectually and morally. This and some succeeding ages we term the golden age. The evolution retrogressively along all the line of man's being followed. The violation of moral, physical and intellectual laws naturally generated sin, ignorance and disease; hence specific and hereditary diseases and accompanying moral and intellectual evils entail wreck and ruin to the race, curtailing life, debauching humanity, until the fulness of time came with its purer and redeeming light of Christianity, evolution was reversed, and the tendency has since been upward.

If we must have a "stone age," place it just there—there it can only belong; then was its most appropriate day. The geological period of that time in Switzerland finds the stone implements of the stone age mixed in the same geological strata with the coins of the Cæsars. The moral strata of that period reveal the almost universal barbarity of the race.

Now, under the elevating power of the moral, mental and physical code of Christianity, obeying these natural laws there enjoined, the world is being redeemed and restored by the New Dispensation to the blessings lost in Adam.

Thus, when we progress in purifying our political, social, physical and moral institutions, the golden age will again be restored, and there shall be no more sins of the fathers to be visited upon the children, and the prediction shall be fulfilled that "a child shall die at a hundred years old." Then, and not till then, will be the golden age in which we egotistically imagine we are now living.

These are some of the things found in the ground, and some of the inferences and deductions drawn from them.

E. S. CURRY, Christy, Mo.

PRESENT PROBLEMS.

Inasmuch as our own age has been noted, above all others mentioned in history, for rapid industrial changes, we find ourselves confronted by problems so new that the guide of established rules or time-honored precedent affords but little assistance in their solution. But they are before us and must be solved, if civilization is not to decline and finally decay.

Within the realm of politics, the great problems of civilization seldom come. Their difficulty precludes the probability of their invading this realm while time-serving politicians can prevent them.

Before the present social problems the questions that divide our present political parties sink into insignificance. The tariff and finance—matters of *per centum* and *per capita*—must be settled on lines of policy, by the methods of cold-blooded business, rather than by the application of any of the principles that underlie and determine the status of civilization.

We hear much, in these latter days, of the "rights of labor and capital," "rights of the different classes," "what the Alliance proposes to do," "how the Knights of Labor have demanded" this or that, and so on *ad infinitum*.

A number of conflicting interests are struggling to maintain themselves in the industrial and social worlds.

The most heroic methods for relief, in the way of legislation, have lately been proposed. A spirit of unrest and discontent is abroad in the social world. Sometimes it is guided by ignorance, fanaticism or treason, and is guilty of crimes against society. Sometimes it seeks only the natural rights of those it inspires.

In the general clamor for the rights of this class or that—even among the producers of wealth—there is but little chance of immediately harmonizing these various interests.

The problem that seems to include most of the others that now confront us is this: How can the industrial forces be so adjusted as to restore and preserve social equilibrium?

These forces are now "out of balance." What causes have produced this state of affairs? It is a great mistake to suppose that vicious legislation is more than one of three, four or a half dozen causes. As legislation did not produce it, legislation can not immediately remedy it. Legislation that seeks to bestow direct benefits on any supposed weaker class is too much like bestowing daily alms on an able-bodied man without providing him with the means of self-support.

We must look further for these causes.

One of the most prominent, as well as most potent, is the inventor. He commenced his work that now is bearing fruit by inventing the steamboat in 1807. About this time the cotton-gin and spinning jenny, which he had previously invented, came into general use. In 1832 he invented the sewing machine, the horse-power reaper and the magnetic telegraph. In 1835 he invented the locomotive. Since the war of the great rebellion he has given to the world so many important inventions that it would take a volume in which to enumerate them.

These inventions have greatly disturbed the social equilibrium. Steam navigation has made ocean travel so cheap, rapid and safe that, despite all immigration laws, the laborer is cosmopolitan. Good wages are almost impossible to maintain while the labor of any portion of the world is poorly paid. Cheap transportation will gradually equalize the prices of labor and all of the products of labor.

Think of the labor-saving inventions! The business man of to-day, by the aid of the telephone, the phonograph and one clerk, can dispatch as much business in

a given time as he could fifteen years ago by the help of a stenographer, five clerks and five errand-boys or messengers. He can now dispense with ten helpers.

The farmer, with the aid of two helpers and a good harvester, can harvest and shock as much small grain in a given time as he could thirty years ago with a dozen helpers. He can dispense with ten helpers. Planing-mills, power scroll-saws and mortising machinery have driven more than half of our carpenters out of employment. The foundries, rolling-mills, nut-and-bolt works and horse-shoe and nail works have materially lessened the number of blacksmiths required. In some instances, inventions have annihilated avocations. One in the possession of a trade that will support a family to-day may find himself robbed of it to-morrow.

But there is a redeeming feature. The inventor has cheapened the necessities of life from two to twenty-fold. He has encouraged artificial wants and increased the desire for luxuries until it takes an army of wage-earners to supply and satisfy them.

With the rapidly changing conditions of this age, something must be done to make a change of avocation more easily effected. Some suggestions on this part of the subject will appear later in the discussion.

Since the beginning of the inventive epoch there has been an unusually decided tendency toward specialism—a division of labor in such a manner as to destroy individualism, independent thought and action.

Herein is another disturbing cause. Men trained as specialists have found it extremely difficult to change their avocations, having usually been narrowed and weakened by their special training. Thousands of specialists have become tramps on the highways rather than try some other calling in life, when they have failed to find employment. The man of one idea must be favorably situated to make a successful race of life.

There is a metaphysical cause for our social disturbances. The civil war and cheap transit since that event have caused our people to travel much more than ever before. They have seen much of the world. Their aspirations have been raised. They have cultivated a higher taste. Their imaginations of the pleasures that accrue from wealth and social standing have been enlivened. Comparisons have stimulated them in many instances to undue strife for greater possessions and attainments. Over-ambition to enjoy the comforts that only wealth can afford has led in many instances to the contraction of debts beyond the power to pay. With financial decline, too often, comes a lowering of the moral standard. Then comes a flood of bad passions to sway and curse the victim. In desperation he grasps at anything that promises a change in the order of things in the social world.

When reminded that certain lines of political policy would encourage revolution or have a tendency toward anarchy, he answers: "We cannot make matters worse than they are."

The concentration of power as a consequence of existing conditions has concentrated wealth to such a degree as to greatly disturb the industrial world. This follows present conditions as an effect rather than as a cause.

Why do some men succeed financially so much better than others? Is it because they are wiser? No. Is it because they are more preserving? No; not always. Is it because they are guided more closely by the principles of common honesty? No; the dishonest man, if he is shrewd and cautious, is as likely to succeed as the honest one. Honesty is the best principle, but it is not always the best policy, the maxim to the contrary notwithstanding. Does one succeed because he is good? No; thousands of good people perish every year for want of the necessities of life. Does industry bring success? No; not always. Does education? No; thousands

of college graduates have become tramps after unsuccessful attempts at earning a livelihood. What, then, is the one great essential of success in the financial world? Strength, force of character.

Observe the force of character in the sturdy Scotchman, the self-denying German or the money-getting Jew. Wickedness nor goodness, honesty nor dishonesty, intelligence nor ignorance, learning nor illiteracy constitutes the deciding factor. Men succeed because they are strong, or fail because they are weak. The race is to the strong. The weak must perish, or, at best, be jostled aside. The golden rule in business exists only in day-dream.

The remedy, or rather the means of preventing such undesirable, objectionable inequalities of fortune seem to be in the direction of individualism—the development of strength of character in such a manner as to meet, so far as possible, each separate case.

It would seem that paternalism in government, followed by a system of complete socialism, must finally prevail unless something is done to equalize the chances of success in life. This can surely be done by taking the opposite course—the one that recognizes the individual as the social unit, rather than the commune as such unit.

If this view is the correct one, we must look to the schools—our educational system—for the means to obtain a perfected individualism.

While no one means can be discovered whereby the social body can “be made whole,” yet the methods by which we train our young will largely determine their chances of success in the financial world.

Our schools are the basis of our hope for the future. They have done a wonderful work in the advancement of civilization. But our social needs have increased, our industrial conditions have changed and our educational wants have multiplied until our educational system is inadequate to supply the demands made upon it. The pedagogue only follows in the wake of the ship of modern progress.

What has our system of education to offer the man who earns his daily bread by the work of his hands? Does not a full course of school study often make its victims more helpless than if they had never seen a school-house? Inasmuch as a large majority of our people must continue to earn their living by means of manual labor, would not our educational system better be modeled accordingly?

The following objections to our present system may be noticed here:

1. It teaches by words, not things.
2. It destroys individuality.
3. It neglects the common branches.
4. It insists on too many studies at one time.
5. It taxes the memory at the expense of the reasoning powers.
6. It is too often inimical to good health and good morals.
7. It inculcates false views of life.
8. It causes inharmonious development.

It would be impossible to here expand on and defend these several propositions in a proper manner for want of time. Only those that are most likely to be disputed can be maintained here.

By the use of words, “empty words,” any subject may be taught without practical results. A practical application of every lesson should be made where it is possible to make it. How many graduates in arithmetic can gauge a barrel, measure a bin, corn-crib or wagon-box and compute its contents, estimate the number of tons in a rick or stack of hay from its given dimensions, calculate the length of rafters for a house of a given width and pitch of roof, tell how much more water will flow through a three-inch pipe than will flow through a two-inch pipe under the same pressure to the square inch, tell the number of gallons in a bushel,

cubic feet in a bushel, cubic feet in a barrel, gallons in a cubic foot, the difference between a dry and a liquid quart, or which is more, an ounce of gold or an ounce of sugar?

How many school graduates, teachers or even college professors could write, spell, capitalize, punctuate and indent ten consecutive sentences sufficiently well as to make them acceptable to a critical proof-reader? Experienced publishers know there are almost none except those who have learned these things outside of the school-room.

The destruction of individuality in our schools is conducive of centralization in its most dangerous form, in addition to the immediate harm it does to the individual child. Most of our graded-school graduates are sent forth as much alike mentally as if they were all cast in one mould. But not all are so influenced. Despite all systems a few will still retain their individuality and strength of character. There is danger that they will go forth into the world to prey upon and control, for their own selfish ends, their former mates and school-fellows.

When an experienced hunter goes in search of game—deer, for instance—he avails himself of the known habits of that animal.

If he understands one, he understands all of that species. They are all alike. So with men under the leveling system practiced in our graded schools; consequently it is comparatively easy for a small minority to influence and rule them about as it chooses. Hence the claim that our system tends toward a dangerous form of centralization—the many ruled by the few. Those who preserve their individuality will, despite all laws, govern those who do not.

Our system is inimical to morals, in that it, by arbitrary grade marks and rewards of merit, feeds the vanity and unduly excites the ambition of the bright and intelligent, and, above all, commends them for what nature and favorable home surroundings have done for them, and insults the dull, but many times industrious, by an unjust condemnation. It is inimical to morals, in that it teaches a false doctrine—causes a false view of life. What could be more false than most of the stories in our school readers? Do not their heroes always triumph in the end? Are not the good rewarded and the bad punished? Do not the villains usually, at the end, make restitution?

The expectation of immediate results has wrecked and soured many a young life.

Out with such sickly stuff! Teach children that it is useless to expect immediate results; that they must do right, whether it pays or not; that honesty is the correct principle, but not always the best policy. If it were otherwise—if honesty and policy harmonized in actual life—none but idiots would be dishonest. What fool would not be honest if "honesty is the best policy?" What merit in honesty if it pays? It is wicked to hold up ideals to children that they can never realize—that cannot be duplicated in actual life.

But the general inharmonious development that results from our system is its worst feature.

Look around you! Is not inharmonious development—one-sided education—the cause of nearly all the suffering, sorrow and so-called sin in the world? The proper limit of an education is the highest point to which the weakest faculty or department of the nature can be developed. Anything beyond this will bring suffering.

The one who neglects all else but his mind will do so at a fearful cost. His knowledge will be of no use to him after he has acquired it.

Should he be fortunate enough to find some sphere in life in which he can use his knowledge, he may get through the world, after a fashion, but, at best, can never be more than "a half of a man."

Another resolves to develop his moral nature at the expense of everything else. He becomes helpless, harmless, and, too often, useless. He loses sympathy with the world and the world loses sympathy with and for him. His force of character—strength—is gone, and with it his influence on those around him. Great suffering must follow as a consequence. And so it would be with the one who develops himself into a perfect animal physically.

The head, heart and hand must be trained at one and the same time. Among them there should be sympathy, harmony, and consequently, symmetry and strength.

It seems to be contrary to the normal order of things for one man to plan or direct and another to execute. So far as possible, the hand should be educated to execute—reduce to practice—whatever the head designs or the heart conceives.

How sad to see the children of our farmers and of others engaged in rural pursuits, rushing to the cities and towns at the first opportunity. Their school training has incapacitated them for manual labor. They have never been shown the possibilities of uniting brain and muscle—of uniting all departments of human nature in the work of farming, fruit-growing, stock-raising, or any other calling that involves manual labor.

Why do children at play exercise so violently without showing signs of fatigue? Because their whole being acts as a unit; the different departments of their nature are in full sympathy with one another. All fairly well organized people can remain young and buoyant so long as they have this power of unity of action—concentration of effort—complete sympathy among the different departments of their nature.

Without knowledge of our environments and sympathy with them, we need not expect to develop ourselves into anything approaching perfect manhood and womanhood.

This knowledge and sympathy will enable us to see the beauties and enjoy the labors of almost any avocation.

Those of you who have spent so many happy and useful days among the fruits and flowers, learning more and enjoying more, each day, as the works of the Creator have gradually unfolded to your understanding, need not be reminded of this fact.

No one can be happy, useful and strong who does not understand, at least to a degree, his environments and attending circumstances and control, them to his own advantage.

This understanding can be reached, to a great degree, by a study of the natural sciences and the application of their principles for the amelioration of the human race. Such an application would be one of the means whereby to attain harmonious development.

All tasks, whether for young or old, should be made pleasurable when circumstances will possibly admit. Exercise that is pleasant will build up and rejuvenate. Unpleasant exercise—mere drudgery—will tear down and destroy.

If the farmer understood the rocks and soils, the nature of the plants, insects and other animals around him, would he not be enabled to see new beauties in his calling?

With such knowledge as the natural sciences afford, obtained not from books, but from an actual observation of nature, would his sons and daughters be in such haste to leave the old farm for "something higher and nobler," as a certain young man expressed it? And so with all other avocations involving much manual labor.

They have their bright sides. It is our duty to find them. We must cease to regard manual labor as a means, but revere it as an end. It is as high as any profession or calling if we direct it by brain power, adorn it by moral force, and thus beautify it by uniting our entire natures in performing it. This is the way to dignify labor and make it respectable in the eyes of those who now scorn it. Then, the sun-burnt skin, the calloused hand and the toughened muscles will not be so many badges of servitude, but will be the evidences of an evenly developed manhood instead. Thus will labor assume its proper dignity and attain the strength that will make itself felt. Then it can demand its rights and enforce its demands. Then it will not cringe nor supplicate.

A broad manhood, such as is herein advocated, will make the task of changing avocations, where circumstances require it, much more easily accomplished. In this way the social equilibrium can be maintained without dangerous disturbance.

It would be pedantic in the extreme to point out both the disease and "the only known remedy" for it, yet a few closing words on methods of accomplishment seem to be required.

The answer to the foregoing, in many of your minds, probably takes form about as follows: "All very well, but visionary. How can our schools be improved, or rather revolutionized, without a great additional outlay of money? We are already taxed too much. If you are correct, teachers' wages must be at least doubled. None but scientists could obtain teachers' certificates or licenses."

Your essayist has heard, met and refuted these objections at intervals since 1875—for more than sixteen years.

In these days of books, cheap current literature and educated people, anyone who actually sets himself to work can obtain an education. The means for obtaining a good practical education are at the hands of almost all.

It is not the teacher who knows the most, nor the one who can best tell what he knows, but the one who can create the most lasting desire for knowledge, that constitutes the best teacher. Good teaching does not consist in imparting second-hand ideas, but in directing, leading, repressing and stimulating, keeping in constant view the necessity of developing the entire nature harmoniously.

Many teachers seem to fear to provoke thought, lest questions will be asked that they will be unable to answer. This is unavoidable and must be expected. Once my little four-year-old son said to me: "Papa, why are some flowers red and some flowers white?" It took me seven years to find the answer.

That the lessons of the school-room may be applied, let every room in our schools be supplied with tape-lines, carpenters' squares, scales, weights and measures, and as many more tools and appliances as means and circumstances will allow. Thousands of dollars are expended yearly for costly globes, planetariums and other apparatus, including usually a lot of worthless charts that are seldom used, that might much better be applied to the purchase of something more useful.

Children are delighted at an opportunity to exercise their muscles in applying their knowledge. To this end, they should be given field-work daily. Give them plats of ground to measure and compute, distances to guess and then measure, lumber to measure and estimate, substances to weigh, etc. Girls will take as much interest in such work as will boys.

The older boys can be given thousands of useful tasks in which they will delight. If in the country, let them determine by actual experiment how many pounds of the different kinds of corn on the cob it will take to make a bushel. They should record their work.

It is true that the school-room cannot be turned into a work-shop, but a few applications in actual practice should be made of every principle learned.

If book-keeping is impracticable because of a lack of skill on the part of the teacher, at least the following should be taught: Plain accounts, promissory notes, receipts, bills of sale, orders for goods and money, checks, drafts, stray notices, and as many other business forms as possible.

Industrial drawing should be taught in all of our schools. Nothing brings the brain and hand into closer sympathy. A knowledge of this branch gives one an immense advantage over one who does not possess it. A few years ago a number of German farmers were collected in a blacksmith shop. It was accidentally discovered that three of the number could select an iron rod from a bundle promiscuously arranged at a distance of twenty-five feet. They could give the size of any rod down to the sixteenth of an inch without hesitation. They had studied industrial drawing.

The stone-mason, who is skilled in this branch, can tell whether a stone will fit into a given place without making measurements.

Drawing is of utility in almost any avocation.

We cannot take a step, draw a breath, stand, recline or repose without coming in direct contact with matter in some, in various forms. The natural sciences treat of matter, whether it appears as a rock, as a plant, as an animal, as air, or in whatever form.

These forms constitute the media in which man exists. How absurd, then, to waste days in learning what Alexander the Great said to Diogenes, hours in conjecturing the complexion and general appearance of the wicked Cleopatra, and months in learning the details of the Peloponnesian war, about which no two authors know or agree, when the whole world of nature that surrounds us, dominates us, and determines our material, and often our moral, destiny, lies practically unexplored.

It cannot be expected that our teachers will, many of them, be able to teach the sciences in the regular book manner. It is not necessary that they should. Observe and record observations. In a note-book on botany, keep a record of the times when each plant in the neighborhood blooms each year, when corn ripens or tassels, when small grain is harvested, a record of wild and cultivated fruits, when the leaves appear on each kind of forest trees, etc.

Another note-book can contain observations on birds and insects. Other notes can be recorded on each branch of science. No text-books need be brought into the school-room. If any of the children become sufficiently interested, they will inquire for more than this limited work will afford them. You can now direct them to a good elementary text-book on the subject for their individual use at home. Only get them interested in nature—in their surroundings. They will do the rest.

In addition to the things above enumerated, let a suitable cabinet be placed in each school. Within this put specimens of the native woods, building stones, fossils, insects, shells, grains, fruits, flowers, etc., of the surrounding neighborhood.

Let children exhibit on stated occasions their own handicraft, as working models, patterns, drawings, designs, etc. Why not a juvenile fair at which none but young mechanics, farmers, horticulturists and florists shall compete?

The fact that the objects in a school cabinet as described above are present in the school-room will have a wonderful effect in teaching the importance of industrial pursuits. Even though the teacher may be unable to teach directly from the objects, they will still be of great value.

Suppose the question arises among the children as to which is the best variety of wheat, or fruit, or as to the best method of accomplishing this or that kind of handicraft? The matter can be referred to some intelligent farmer, fruit-grower or mechanic to decide. This may lead them to visit the school and lecture the children on the subject of inquiry. This will bring parents, teachers and children into closer sympathy, and all will be benefited thereby.

In conclusion, only make the demand for better schools and the supply will surely come. Only make the beginning soon. Ask the Legislature to help us by enacting a few needed laws.

The grocer, the hatter and the merchant keep what their customers demand and are willing to pay for. So with the teacher: he will give you whatever you demand. He dare not go much beyond the demands of his patrons. Will the Missouri Horticultural society and State Board of Agriculture, and all others who desire to see our great State develop and become populated by a happy and contented yeomanry, do something to bring about a solution of present problems by improving our schools?

EDWIN WALTERS, Kansas City.

THURSDAY, December 2—9 a. m.

TO THE MISSOURI STATE HORTICULTURAL SOCIETY.

St. Louis, November 30, 1891.

Mr. President and Gentlemen:

At present I am not a member of your honorable body, but have always read the reports of your Secretary, which have been published after your annual meetings, with great interest.

As Secretary and Treasurer of the Hollister Commission Co. of St. Louis, I am naturally interested in horticulture and anything appertaining thereto, and noticing in reading your program that you invite co-operation and would like suggestions, etc., I have taken the liberty to address you. I have a subject that no doubt will prove interesting as well as beneficial to all concerned. It will benefit the producer, dealer and consumer alike, and I trust the same will be discussed thoroughly at this meeting and referred to your Committee on Legislation.

To make our business dealings more pleasant, to avoid misunderstandings which at times lead to law-suits, and principally to weed out an element that resorts to unfair means of underselling reputable concerns, we need "a standard barrel."—a barrel that must be of such dimensions as may be established by law. This will create honest competition, and will stop "A" from under-selling "B" by shaving down his barrels to hold ten pecks instead of eleven or twelve pecks. It will put the dealer, producer and consumer on an equal basis, and in the fight for business let the best man win. We all pay just as much freight to the carrier for hauling a barrel that contains ten pecks as we do for one that contains three bushels. The small amount of fruit saved by skimming a barrel does not therefore benefit the grower or the dealer, and the consumer is the sufferer.

In St. Louis and other markets which are distributing centers, a great many orders are received for mixed cars of produce. The buyer may want ten or fifteen different varieties of apples, etc., and generally is very specific as to number of barrels of each variety he desires. In order to fill such orders as per instructions,

it becomes necessary at times to use fruit from five or ten different packers, and, strange as it may appear, each packer has a different size or style of package. The order is filled with best of care, and the buyer is advised that his order was promptly filled with fine fruit, which, no doubt, will give him satisfaction. The car makes schedule time, and fruit is in good condition. Mr. Buyer possibly does not find the demand as brisk as anticipated, or market may be easier. Kick he must, but where is it coming from? Oh! On unloading he discovers one package smaller than another. Having paid as much for one as the other, he at once writes or wires, "Your fruit is all right, but I will not pay as much for a nail-keg full of fruit as I will for a barrel full. You must allow me twenty-five cents per barrel or I cannot accept. These abuses are practiced so frequently that they have become unbearable.

I will not impose on you by taking up too much of your valuable time, but I could continue at length pointing out the abuses and losses to dealer, producer and consumer caused by the use of snide packages. I am satisfied that there are eloquent speakers and men of experience with you at this meeting who, I am convinced, can explain the good results that will follow when a barrel in the State of Missouri will have a standard.

Your body is a representative one, and a bill to our Legislature for any reasonable measure would, I am sure, be carefully considered and acted upon. You can raise as fine fruit in Missouri as can be grown anywhere. Pack the same carefully in standard packages, and it will not be long before Missouri fruit will have a reputation, and buyers will come to you instead of you being forced to find the buyer.

Respectfully yours,

J. H. VOGELSANG.

REPORT OF COMMITTEE ON STANDARD SIZE OF FRUITS AND STANDARD PACKAGES.

Standard Apple-barrel.—Your committee beg leave to report that we adopt for a standard apple-barrel as provided in section 8858, Revised Statutes of Missouri of 1889: Length of barrel, $28\frac{1}{2}$ inches, with chines of three-quarters of an inch at the ends. The diameter of the heads shall be $17\frac{1}{4}$ inches. The diameter of the center of the barrel inside shall be $20\frac{1}{2}$ inches (R. S. 1879, § 7667), this being the size used for flour-barrels.

Carried.

Peach Packages.—That we adopt the six-basket crate for fancy peaches, and the third-bushel box for medium to small peaches.

Carried.

Small-fruit Boxes.—That we use a full dry-measure quart box for all small fruits except the red raspberries, which shall be a shallow pint box.

Carried.

Size of Standard Apples.—Standard size for Ben Davis and other large apples shall be not less than $2\frac{1}{2}$ inches in diameter, and shall be free of worms, bruises or scab. For Winesaps, Genetings, and other apples of this class, size shall be not less than $2\frac{1}{4}$ inches in diameter, and shall be free of worms, scabs and bruises.

Carried.

S. W. GILBERT, Secretary.

F. Holsinger made a minority report recommending the wine quart for berries.

The report was taken up section by section. The section recommending the flour-barrel size for apples was adopted. The six-basket crate for fine peaches and the third-bushel box was adopted for small and medium peaches.

The minority report in regard to the berry quart was rejected and the full dry-measure quart was recommended.

DISCUSSION.

C. C. Bell—It don't hurt anybody to give full measure, like the Scripture says.

F. Holsinger—This committee was constituted in favor of the commission men. All through the South they use the small or wine quart. We have adopted the wine quart for the Kansas City market. Poor old Missouri wants a big quart. One gentleman computes the difference on his crop and finds that by using the large quart it amounts to 2,700 quarts given away. For one, I am going to sell in the small quart.

Mr. Mider—We are willing to give you just as large a quart of berries as you use for whisky. You Missourians ought to be satisfied with that. Wine measure is the standard nearly all over the country. When Arkansas starts in the spring, will she ship in the dry quart?

J. C. Evans—I would inform the gentleman from Kansas that we buy whisky in golden jugs, and make arrangements with a pottery in Mr. Bell's town to make them just a little large.

A. Ambrose—I think this Society can do but little toward adopting a uniform standard. I am in favor of the smaller-size package. The berry business has not been profitable for several seasons. We get the same for the box of berries, little or big.

C. C. Bell—I am not a commission merchant; I never have been one. I advocate a dry-measure quart because the berries are not in a liquid form. I want this State society to be willing to give good measure, good fruit and good packing, and the trade will find it out. I find the consumers soon learn the difference between a full-size package and a small one.

B. F. Smith—We always used the dry-measure quart. In Denver they say the small package brings the best price. They carry better. I am now in favor of wine measure. The whole South uses this quart. Even Michigan use the wine quart.

L. A. Goodman—It does not seem to me that you can deceive the people very long. I would be sorry to see this Society recommend the small quart. The only advantage the smaller has is in carrying long distances. Where it is not known, you may deceive them for a few

years. I one year sold my whole crop to a Denver commission man, who required me to put them in the small quarts. It saves a few berries, but it is a question whether you save anything in the end. I hope this Society will recommend the large package.

A. J. Blake—The consumer seems to be left out of the question. It is now very difficult for the consumer to get pure food in the city. Are you going to give short quantity also? Can you afford to say to them that you shall pay just as much for that which is not a quart as for that which is? You can not deceive them for a long time. I know several good women in St. Louis who say to their grocers, "we will not have the small size box of berries." They send it back. To adopt or recommend such a package is a mistake.

E. T. Hollister—A good deal has been said about the commission merchant. I am not going to say that all commission merchants are honest. Take them as a class, their integrity equals that of the growers. How many of you put the poor apple in the middle of the barrel? I have seen many thousand barrels packed in that way. Fresh berries in wine quarts will sell for more than old ones in dry quarts. But have the fruit the same, and the larger package will bring the larger price. The few berries you save amount to nothing when compared to the difference in prices we are compelled to accept in nine cases out of ten. You pay the same for your case, you pay the same for picking, the same expressage. The little amount of berries you save don't pay you for the twenty-five or fifty cents less you get in the market. In a local market I have nothing to say. You meet your consumer, he sees your box of berries and buys them for what they are.

J. H. Logan—I sympathize with Mr. Hollister. It don't make any difference to the commission men what they get for our fruit. The shipper pays all the expenses and they get their pay for selling, whether there is anything left for the producer or not. We do know the smaller package carries better than the large.

Upon a vote the full size dry-measure quart was recommended for berries.

The standard size for large apples, such as Ben Davis, not to be less than two and one-half inches in diameter. The smaller apples, such as Genet and Winesap, not to be less than two and one-fourth inches in diameter.

The report as a whole was adopted.

REPORT OF COMMITTEE ON TRANSPORTATION.

WHEREAS, It is an undoubted fact that the shipments of fruits and vegetables are much greater in volume than the shipments of grain in the United States, and that their production is increasing so rapidly that the supply is annually forcing the prices down to a point at which it is becoming unprofitable, and will have to be abandoned unless the common carrier is made to realize the importance of this line of business, and to extend further facilities and accommodations and better rates; and

WHEREAS, The said products are in almost all cases loaded by the shipper and unloaded by the consignee, and carried by the railroad companies at the risk of the owners, with a guarantee or prepayment of freight charges, entailing no loss upon the company in case of loss or damage in transit; and

WHEREAS, From the perishable nature of the goods, it is necessary to unload and dispose of them as soon as possible after arrival, and from the style of the packages they are easily and quickly unloaded, and do not detain the cars as long as is usual with shipments of grain; therefore, be it

Resolved, That in view of these facts, it is the belief of the members of the Missouri State Horticultural society that the horticultural products of the country are justly entitled to the same classification and rates as grain, and we respectfully ask the managers of the railroads of the country to place our products in the same class as grain and give us the same rate, feeling certain that the increased volume of business will amply compensate them for doing so.

Your committee would very respectfully recommend that the Secretary be instructed to cause this preamble and resolution to be printed, and to forward a copy of the same to all general freight agents within his reach, accompanied by a personal letter asking them to give it personal attention and to grant our very reasonable request.

E. T. HOLLISTER, Chairman.

A. Ambrose moved to appoint a committee to meet the representatives of the railroads and place the matter before them. Nothing was accomplished by the Nurserymen's association till they adopted this plan. After two years' work, they secured the classification and rates they asked for.

C. C. Bell—The only way to bring the matter before the railroads is to present it to them when they meet in their association to consider rates, classification, etc.

J. M. Rice—My experience for the last three or four years goes to show that to effect anything in regard to transportation requires concert of action and the work to be thoroughly done. By the proper presentation of the subject, the railroads have given us a hearing. The manager of one road has no more power to act than I have. The roads have their association and work together. The Inter-state Commerce

law makes it necessary for the roads to adhere to their regular rates and classifications. The shipper must not expect them to vary in this respect.

The report of the committee was adopted.

Mr. Ambrose moved to appoint a committee of three to meet with the managers of the railroads and lay the question of transportation before them.

The motion was carried, and C. C. Bell, J. M. Rice and L. A. Goodman were appointed—Mr. Ambrose declining to serve.

PREMIUMS.

The premiums were awarded upon the merits of each lot, plate or collection. About 500 plates of fruit were on exhibition, and \$100 was to be divided between the exhibitors. This would give each average plate 20 cents. It was the aim of the committee to give those which were above an average more than that, and those below an average less than that. The committee worked honestly and faithfully, and not one single complaint has been heard about the award. It has worked well, and I believe it is the only true way to give premiums, and the only satisfactory way.

We shall hereafter follow this plan, and the only trouble is going to be, what shall be our standard of merit?

L. A. GOODMAN, Secretary.

AWARDS.

- J. H. Monsees, Beaman, 15 plates apples, \$4.50.
- Olden Fruit Co., Olden, 25 plates apples, \$12.75.
- A. H. Gilkeson, Warrensburg, 11 plates apples, \$2.
- Turton & Keith, Holden, 26 plates apples, \$12.25.
- Shepherd & Wheeler, Lamonte, 66 plates apples, \$21.
- A. Nelson, Lebanon, 51 plates apples, \$15.
- Sam Miller, Bluffton, 12 plates apples, \$4.50.
- N. F. Murray, Oregon, 5 plates apples, \$2.50.
- S. W. Gilbert, Thayer, 30 plates apples, \$7.
- L. Geiger, Boonville, 3 plates apples, \$1.
- J. Kirchgraber, Springfield, 18 plates apples, \$6.
- D. S. Helvern, Mammoth Springs, Ark., 7 plates apples, \$2.50.
- J. H. Logan, Nevada, 8 plates apples, \$3.
- C. Teubner, Lexington, 4 plates apples, \$1.
- M. Butterfield, Lee's Summit, 6 plates apples, \$3.
- J. Gamble, Brookfield, 6 plates apples, \$3.
- E. W. Young, Fayetteville, 1 plate Ben Davis, 50 cents.
- W. H. Carpenter, Avalon, 1 plate Ben Davis, 50 cents.
- Z. T. Russell, Carthage, 1 plate Ben Davis, 25 cents.

NEW APPPLES.

- A. Nelson, Lebanon, 1 plate, \$2.50.
- G. F. Tippin, Springfield, 1 plate, 50 cents.
- C. Teubner, Lexington, 1 plate, \$1.
- D. S. Helvern, Mammoth Springs, Ark., 1 plate, 50 cents.

- D. M. Dunlap, Fulton, 1 plate, \$2.50.
 W. G. Gano, Olden, 1 plate, \$1.50.
 Turton & Keith, Holden, 1 plate, 50 cents.
 B. F. Smith, Lawrence, Kas., 1 plate pears, \$1.
 Geo. A. Deltz, Olden, collection evaporated fruits, \$10.
 Conrad Hartzel, St. Joseph, collection apples, \$5.

FLOWERS AND PLANTS.

- E. Keoppin, Sedalia, collection plants, \$12.
 P. Pfeiffer, Sedalia, collection plants, \$5.
 J. Kirchgraber, Springfield, collection flowers, \$3.

G. F. ESPENLAUB,

R. PERRIAM,

C. I. ROBARDS,

Committee on Fruits.

S. MILLER,

MRS. G. E. DUGAN,

MRS. A. NELSON,

Committee on Flowers.

THE WORLD'S FAIR.

Messrs. Gentry and Gwynn, of the Missouri Commission for the World's Fair and Columbian Exposition, being present, the Society took up the subject for discussion.

Mr. Gentry—The Commission have not yet arrived at the point of making a division of the fund among the several industries and resources of the State to be represented at the Fair. No class of men have made a more forcible impression upon the Commission than the horticulturists, and none will come nearer getting what they ask. We feel satisfied that Missouri will come out ahead in the horticultural exhibition.

Mr. Gwynn—We have just been in your display room and seen your beautiful display of fruit. It was my good fortune to visit the display made by this Society at the St. Louis exposition a few years ago. From that day I have been enthusiastic in favor of horticulture, and I believe you will come nearer getting what you ask than any other set of men who have come before the Board. I am with you. Mr. Samuels, the head of the Horticultural department of the Fair, says that the whole State of Missouri is a horticultural State.

J. C. Evans—We thank these gentlemen, Mr. Gentry and Mr. Gwynn, for what they have said to us to-day. I am perfectly satisfied that our cause will be attended to properly. I am sure we will be treated right. I hope this good feeling will continue to exist between the State Horticultural society and the Board of Commissioners for the World's Fair.

N. F. Murray—One thing in connection with this work deserves mention. The Commission have found that \$150,000 is insufficient for the work. If we don't have the appropriation increased, we will find ourselves swamped. The President of the Board of Trade of St. Joseph says we should take action on the subject, and have the Governor of the State include a proposed increase of the appropriation in his call for an extra session of the Legislature, as there is a probability of an extra session. The business men of St. Joseph say we should not ask for less than \$300,000. I don't want to go to the Fair at all unless we can make an exhibit of which we need not be ashamed. The appropriation is not half sufficient. I am willing to join hand to hand with the people of our great State to make the greatest display Missouri has ever made, and place Missouri before the world as she is.

C. C. Bell—If anything can be done to have the appropriation enlarged, it should be done. You cannot hope or expect to do something with nothing. To make a show alongside the exhibits of the other states will cost something. It is the business of our Legislature to make that appropriation. It should have been \$300,000.

Sam Miller—Should not our members instruct their members of the Legislature to vote for an increase in this appropriation? I think we ought to do everything in our power to this end.

A resolution was passed asking Gov. Francis to recommend to the Legislature to increase the appropriation for the World's Fair to \$300,000.

W. G. Gano—I move that J. C. Evans be recommended to the State Board of Commissioners as superintendent of Missouri's horticultural exhibit at the Chicago World's Fair. Carried.

SOME SUGGESTIONS ABOUT THE WORLD'S FAIR.

The World's Fair: everyone is interested in it. Every Missourian wants Missouri to take her proper place in this the greatest fair ever held. We want Missouri well represented in every department. It seems as if a new era was opening up before our people, and as if every man, woman and child are anxious that Missouri have just a fair chance to show what she has within her borders.

I am loyal to Missouri, and it does seem to me that if people only understood one-half the advantages which Missouri has to offer to the new-comer, they would come to us by the thousand. There is nothing more settled in my mind than this fact; and hence it behooves us to be ready to show what we have, what we grow, what we buy, what we sell, what we can do in *every department* of work, from the least unto the greatest.

Do I put it then, friends, too strongly in saying that horticulture is the most important factor in the development of our State to-day? That it is *the* one which will produce the greatest results of any one matter which will come up in the State in the next fifty years?

I think that the friends of horticulture have enough influence, the subject is of enough importance, to demand a fair and just share of the amount appropriated for the display of horticulture. What to do? how to do it? when to do it? where to do it? are questions to be answered soon.

Taking our display as a whole, it is my opinion, and I believe the only just plan, to make the display in something the same way as we made the display at St. Louis Exposition. I think there never was a display of like magnitude, of over 4,000 plates, planned and carried out as satisfactorily as was that one.

The plan is to put in counties all the display which comes from that county. Give each county an opportunity to do all that is in their power, and they shall have all honor due them. This will give much enthusiasm to each county, and those which do the best will get their reward, while the State as a whole will get the credit due her. I would, if every county would make a display, lay out the plat given to us in the shape of Missouri, and each county in its proper location, and its fruits in position, thus making a huge map of Missouri. In fact, would it not have been a notable departure if the ground allotted us could have been laid out as a State, and all the displays from Missouri be put in their counties, with just such displays as the counties choose to make; every county mapped out by lines between them. One could then take a journey through Missouri and find just the place he was seeking after. If mineral lands, when he came to Jasper county he would see them; if agricultural lands, when he came to Pettis or Saline, he would see the finest in the world; if timber lands, Mississippi and Dunklin would give him answer; if pine lands, Shannon could answer him; if a stock region, then numbers of counties could say, come in; if fruit lands, then a hundred counties could answer, here am I, take me.

But as it seems this cannot possibly be done in either case, I still insist that the only correct way to carry out this display is to make each county separate and distinct, and the systematic whole to be a State display.

No premiums at all should be given either by the Fair or by the State as competitive in any of these departments (or in fact in any other department, I think, but of course I am now seeking to give direction to the horticultural line of work). If the Commission find that they have money to assist county work, do so, but by no means invite competition in county displays if you want a systematic and satisfactory State exhibit.

The display at St. Louis was made by counties, and we used 500 barrels of fruit in this display in the forty days we continued it; and at its close we had on the tables 150 barrels of apples.

The World's Fair being from May to December, will give us opportunity to make showing continually of all our fruits as they ripen. It will take an immense amount of fruit and an endless amount of work to do this, which only those who have had it to do can understand.

We shall want our florists' help in this regard as much as the fruit men, and our tables should be decorated with florists' plants and evergreens in abundance.

Now the general decoration, of course, the Commission wants to do as a systematic whole. There should be hundreds and hundreds of palms and evergreens in large pots or tubs used in this general decoration; the special decoration will, of course, be in the hands of the county workers.

Of course, the plans for tables and display, all the carpenter work, and any large and costly work for general effect, should be done by the Commission—such as for instance a column of fruits forty feet high, huge pyramids of apples, large arches with clusters of grapes covering it, or any such sort of display. The expense should be borne by the Commission as a whole.

At once, now, immediately there should be a lot of jars procured, holding a gallon or more, and the best apples should be put into them for use and experiment. We are not so sure in all these matters, and at least one hundred jars should be filled this winter with such experimental work.

Next summer we must begin with our strawberry season, and put up as they ripen all the standard varieties of berries, cherries, plums, quinces, peaches, pears, grapes and apples. Two or three thousand jars will not more than suffice, and some of them need to hold two or three gallons. These fruits, well labeled and well shown, will be of incalculable advantage in showing our fruits.

In the fall, then, when a large portion of our fruits are ripe, we want a general display of the fruits from October 1st to to the close of the Fair.

At another time we want a general floral display, rose display, chrysanthemum show and plant show.

All through we want a good showing of nursery stock and forest tree planting.

At another time we want a general display of vegetables, grains and grasses.

This display, as a whole, cannot remain for six months just in one plan, but continually must be changed and modified, and perhaps once or twice a complete change.

We want to have screens so that when we are making any great change, we can separate ourselves from the people and let them pass by.

A collection of fruits in wax would be a great addition to our display. Correct representations of all of our best fruits, with their coloring correct and distinct, each labeled correctly, and displayed in taste would be a standing and continual display, which would be appreciated by every onlooker. Our government intends to make such a display in their department, but that will not interfere with what we want to do in this matter also.

Obtaining rates on the railroads and from the express companies would of course be given so that our fruits could be transported without too much cost. Cold storage at Kansas City and St. Louis will have to be obtained, and also cold storage in Chicago near the grounds.

As I understand the plan of work will be submitted to the one appointed by the Commission. We have been before them and presented the necessity of our case and the money needed to carry it out completely. We want them to appoint our President, J. C. Evans, and set aside something near the amount of money required to carry out the program as herein outlined or we cannot compete with the other States in their display.

If it cost us \$1,250 to make the display of fruits at St. Louis for forty days, having over 4,000 plates on exhibition, and no one receiving one dollar of pay, and not one dollar paid out for fruit, and only half rates paid for express rates, and nothing paid for cold storage, what, may I ask, will it cost to have 10,000 plates on exhibition, 5,000 jars of fruit, all the small fruits, strawberries, raspberries, blackberries, grapes, peaches and pears, which were not included in the above exhibit? Add to this the decoration, which was done by the Exposition in St. Louis, and the floral display, and all the other departments of horticulture, and you can realize to some extent the magnitude of the undertaking and the cost of the same.

While it would seem, from our consultations with the Commission, that they will not be able to give us \$25,000 for this display, yet the excessive cost of this work, and the speedy destruction of the specimens, make a larger amount of money necessary than any other line of work.

The importance of the cause justifies also a large outlay, for it is the one thing in this State capable of greater development than any other line of work.

In discussing this matter, therefore, we want suggestions, advice and criticisms, in any department of the work; and now I leave the matter in your hands and the hands of the Commissioners, to hear what they have to say.

One thing we want settled soon: the naming of our man and the amount of money to be set aside for the use of the society.

L. A. GOODMAN, Westport, Mo.

The following was presented by Mr. Perriam, editor of "Prairie Farmer," as the action of the horticulturists:

COPY OF REPORT TO THE AGRICULTURAL COMMITTEE.

Believing it will result in economy to the Exposition management, besides being an act of justice to a certain class of exhibitors, and also create a superior exhibit, I would recommend that an appropriation of \$45,000 be devoted to cash premiums. No manufacturer of any horticultural appliance, or any person or corporation, who could be benefited from advertising a business, should receive a cash premium. On the other hand, the exhibitor of fruits and plants who makes collections at great expense, pays freight or express charges, is protected by no patents, and receives no special benefit, and finally loses everything at the end of the exposition, should be reimbursed for some of his outlay. As a prize that would be offered amounts to a very small per cent of the value of the article exhibited, it seems to me it would be a wise policy to induce the owner of meritorious specimens to offer them for competition rather than be compelled to purchase for the account of the exposition. Some of the rarest and most beautiful plants could not be bought or borrowed, and the only way in which they could be secured for display would be to offer competitive prizes.

DIMENSIONS OF HORTICULTURAL BUILDING.

The following dimensions were given by Jonathan Perriam, editor of Prairie Farmer, Chicago:

Main building, length.....	1,000 feet	
" average width.....	238 "	
" extreme width.....	287 "	
" minimum width.....	214 "	
" ground floor area.....	229,208 sq. feet	
Dome, height..	132 "	
" clear inside.....	113 "	
" diameter.....	187 "	
Central section, length.....	221 "	
" clear inside.....	216 "	4 in.
" width.....	238 "	6 in.
" clear inside.....	232 "	4 in.
" height to top of wall.....	33 "	
" " over Loggia.....	54 "	
" height of figures in relief.....	6 "	
" area of ground floor.....	50,112 sq. feet	
Front curtains, length.....	269 "	6 in.
" width.....	73 "	6 in.
" clear inside.....	68 "	8 in.
" height to top of wall.....	22 "	6 in.
" " glass roof.....	45 "	
" area of ground floor..	18,515 sq. feet	
Rear curtains, length.....	343 "	
" width.....	50 "	4 in.
" clear inside.....	45 "	8 in.
" height of wall.....	22 "	6 in.
" height to top of roof.....	41 "	6 in.
" area of ground floor.....	18,762 sq. feet	
" table space.....	5,160 "	

Open courts, length.....	269 feet 6 in.	
“ “ width.....	89 “ 8 in.	
“ “ area of ground floor..... 23,774 sq. feet		
End pavilions, length.....	122 “	
“ “ clear inside.....	115 “	
“ “ width.....	254 “ 9 in.	
“ “ clear inside.....	247 “ 9 in.	
“ “ height of wall.....	48 “	
“ “ of first story.....	22 “ 6 in.	
“ “ to top of roof.....	76 “ 6 in.	
“ “ area of ground floor..... 28,497 sq. feet		
<hr/>		
Square feet of ground floor in Horticultural building World's Columbian exposition		235,000
Square feet of ground floor in horticultural building, Philadelphia, 1876.....	73,919	
Square feet of ground floor in Horticultural building, New Orleans, 1834-85.....	68,400	
Square feet of ground floor in Horticultural building, Paris, 1889..	33,000	175,319
World's Columbian exposition over all.....		59,681

Ten miles of 1½-inch steam pipe required to heat the dome alone.

The following letters were read :

WORLD'S COLUMBIAN COMMISSION
OFFICE OF THE
DIRECTOR-GENERAL OF THE EXPOSITION. }

Department “ B ” Horticulture.

CHICAGO, ILL., U. S. A., Nov. 30, 1891.

DEAR SIR—We would suggest that you make it a point to discuss, at the coming meeting of your Society, ways and means for making a collective exhibit in the Horticultural department of the World's Columbian Exposition in 1893. The opportunity for making a complete display of the horticultural resources of your State is one that should not be lost, and we would urge that action be taken toward that end at as early a date as possible.

This Department will help you in your efforts in every way they can, and we will be pleased to furnish any information you desire.

It would be useful to this Department to have on file in the office a copy of the report of your meeting, and we hope you will be able to spare one for us when issued. In the mean time, if you have any copies of last year's report still on hand, we should like to have one, as we may have occasion to use it before the later one reaches us.

Colored lithographs of the Horticultural building, bird's-eye views of the grounds, classification and special rules of the Department, etc., are now in press, and we will send them to you as soon as possible. Blanks on which to make application for space will be furnished upon request.

Wishing you every success, I remain,

Very respectfully,

J. M. SAMUELS,

Chief Dep't Horticulture.

Department “ R ” Horticulture.

CHICAGO, ILL., U. S. A., November 30, 1891.

DEAR SIR—You will confer a favor on this Department if you will let us know, by return mail, the date of your meeting this winter, and if you will keep us posted as to the dates of all future meetings occurring from now until the close of the World's Columbian Exposition.

If you can send us a list of the county horticultural societies in your State, with the dates of their meetings, if possible, you will very greatly oblige,

Yours respectfully,

J. M. SAMUELS,
Chief Department of Horticulture.

SPACE APPORTIONED TO STATES.

The following space in the Horticultural department has been allotted to each state and county in the Horticultural building, which, except for a certain quantity left over for contingencies, is all there is, big as the building is :

	Square feet.		Square feet.
Alabama.....	2,000	Nebraska.....	4,000
Alaska	4,000	Nevada.....	2,000
Arizona.....	2,000	New Hampshire.....	2,000
Arkansas	4,000	New Jersey.....	6,000
California (with space open court) 6,000		New Mexico.....	2,000
Colorado.....	4,000	New York.....	8,000
Connecticut.....	2,000	North Carolina.....	2,000
Delaware.....	4,000	North Dakota.....	1,000
Florida (with space in open court) 3,000		Ohio.	6,000
Georgia.....	2,000	Oklahoma.....	1,000
Idaho.....	2,000	Oregon.....	4,000
Illinois.....	6,000	Pennsylvania.....	8,000
Indiana.....	6,000	Rhode Island.....	2,000
Iowa.....	5,000	South Carolina.....	1,000
Kansas.....	5,000	South Dakota.....	1,000
Kentucky.....	5,000	Tennessee.....	3,000
Louisiana.	2,000	Texas	3,000
Maine.....	2,000	Utah.....	1,000
Maryland.....	4,000	Vermont.....	1,000
Massachusetts	4,000	Virginia.....	3,000
Michigan.....	6,000	Washington	3,000
Minnesota	4,000	West Virginia.....	2,000
Mississippi.....	2,000	Wisconsin	5,000
Missouri.....	6,000	Wyoming.....	1,000
Montana.....	2,000		

THURSDAY, December 3—2 p. m.

Election of officers :

J. C. Evans, Harlem, was elected President.

N. F. Murray, Oregon, Vice-President.

L. A. Goodman, Westport, Secretary.

A. Nelson, Lebanon, Treasurer.

SECRETARY'S REPORT.

All the best things of life are free for everyone. The air we breathe, the pure water of our springs, the beauties of nature, the light of the sun, moon and stars, the wind, the rain, the landscape, the beauties of our city buildings, all things of nature we can see or hear, are free as the air we breathe.

A gentleman wishing to buy a lot across the road from where I live, objected because it had no trees or shrubs to beautify it, while mine was filled with beautiful evergreens and ornamental trees. I soon convinced him of the desirableness of the location, because he had every advantage of location, and could certainly enjoy the beauties of my lawn as well as I or any one else. No one could hinder persons in their enjoyment of beauty, for that was free. He soon decided to build there, and now enjoys the beautiful trees as much as I who have spent twenty years in caring for them.

As free as are the beauties of nature, or as the air we breathe, so free is the knowledge which the horticulturist is giving every day of his life. No more unselfish person in all this world lives, than the horticulturist in his profession. He will spend years and years in finding some new plan, or new fruit, or new idea, and when found will make it known to the world. Our best fruit men will spend hours in talking, days in writing, and months and years in experimenting, all to be given to any person who is interested enough to ask them how it is done.

How many of us have given out facts of our profession, which have cost us months of labor and many dollars of money to prove, for the mere asking. Can you point to any other profession which will begin to do as we do? The other day a certain lawyer in Kansas City asked me questions about planting an orchard, which answers were worth thousands of dollars to him, and yet he never once thought of paying for any of it. That same lawyer charged me \$5 for writing up a contract.

This one thing we can be proud of: that the horticulturist is truly unselfish in regard to knowledge of our work, and I am glad it is so, for our work is continually one of instruction and love, and we are happy when we have some new fact to give to the people. Our Society has been one of growth, of improvement, of instruction.

The first report that I published as Secretary of this Society was for the year 1883. I well remember how the contract was made with the State printer for \$623 for 1,000 volumes, printed and paid for out of the annual allowance of \$1,000 per year. From that time there has been no backward step, and the nine publications will stand as something of value to the fruit-growers, and they have been a great factor in the development of the fruit interests of the State. The members of this Society and the work of this Society have done more to attract the eyes of the people to this State and to locate good earnest families than any other one cause. Our influ-

ence is not limited by the bounds of Missouri, nor are we held by any cast-iron rules. But, on the contrary, our influence has extended into almost every State of the Union, and been the means of bringing thousands of fruit-buyers and fruit-growers into our grand old State.

The people of this State, as well as other states, are now turning their eyes toward Missouri as the best fruit district in all the United States. Day by day is our work growing, little by little is our influence spreading, step by step are people coming, and acre by acre are our forests being turned into orchards. There is no wild impulsive movement, no great boom, no great speculation, but a steady, continual growth, such as shows a healthy feeling and a good work done. Why, Mr. President, had one-half of the talking, and coaxing and blowing been done for our State that is done for many states or places, we would see thousands more of people, but not near the sound, steady feeling which we now have.

Very few appreciate, even in our own State, the wonderful influence and power of the 1,500 members of our local societies in bringing some of the best families into our midst, not by ones, but by thousands.

Already has our State received a hundred-fold in return for all the money spent in aiding the State Society. No one need be afraid to ask our State Legislature for assistance in sending out the facts of the advantages of this State in the horticultural line. Our World's Fair Commissioners were completely surprised when they were informed of the wonderful growth and possibilities of the fruit interests of the State, and consent was immediately given to allow more to the fruit interests than to any other one interest.

Did you wonder at our fruit crop last year? What will you say to that of this year? Strawberries in unbounded profusion; strawberries like hens' eggs—every one could eat them, eat them in plenty and enjoy them too. Raspberries, such as was never known before, by the quart, crate, bushel, hundreds of bushels, until every man, woman and child could get their fill. Blackberries, large and luscious, in great abundance, and fit for a king to eat.

It is not an unmixed evil to have fruit so plenty or so cheap. It gives a taste of fruit to thousands who otherwise would not get them, and thus causing them to use, as an article of food, some of the health-giving fruit, instead of so much of unhealthy and unnatural foods. This taste for fruit grows on them, and soon they will be using ten quarts where they now use one. You will find this taste for fruit thus growing all over our land, and thousands of bushels are now used where there used to be one.

Then the peaches: there never were finer peaches, or better, grown than were grown last year. They were scattered far and wide, north and south, east and west; they went from the Rocky mountains to the Alleghanies, from the Gulf of Mexico to the great lakes. Thousands upon thousands of bushels, car-load after car-load, were sent to the markets, and returns made in the shape of dollars.

Grapes, plums, pears, cherries, rich and luscious, grand and beautiful, supplied our markets in their season. Apples in abundance, apples everywhere, and good prices for all apples to Europe, to South America, to Mexico, to California, to the mountains; apples only such as Missouri can raise, handsome as no other land can make them, good as only our soil and climate can give; apples which bring \$20, \$40, \$80, \$160 per acre are gold mines such as the ground will give to those who know how to get the gold out.

What is the worth of our fruits? Ten millions will not cover the market value of that sold, and ten millions more is not the entire value of those used at home, evaporated or dried for market. Thirty thousand fruit farms or fruit-

gained. A park or college grounds well laid out by "one who knows," is an object-lesson to all who visit it, and has a wonderful influence on the whole community, which is not long in being felt.

Now a word for an experimental forest at Nevada. Every member should use his influence to have here a planting, the model of what forestry can be and will be some day in this country. The time is coming, not when we must stop cutting down trees, but when we must plant a forest all over our land. I am no sympathizer with this cry of "stop cutting the trees," for that is what they were made for. But I am in earnest in the cry of "plant forest trees!" plant them everywhere they will grow, take care of them; plant! plant! plant! the time will come when they will bring blessings and money too.

Suppose we might have two or three or four hundred acres of that beautiful section of land of our Insane asylum there, devoted to the growth of our forest trees and evergreens for "forests," but let them be planted in such a judicious and systematic whole that it would resemble a park as well as a forest—planting varieties in groups with vistas between, some on hill-top and some in valley, each in its own desirable location. What think you would be the value of such a planting in the years to come as a teacher to our people? What would they learn by such an experience? What would they take for such a park?

It is hard to place a money value on such a planting. It is still harder to place a value on the experience given us in such a work done. It is still harder to tell the value of such lessons to the people of our State, and its influence upon us all.

So, in a smaller degree, is the influence of all our college grounds on our young people, as well as the surrounding country. Then we do well and wisely in aiding all such plantings and decorations in every possible way. It is a part of horticulture, and a very valuable part also, and as such our State Society takes it as part of its work of instruction to our people.

"He who plants a tree,
Plants a hope;
Can'st thou prophesy, thou little tree,
What the glory of thy boughs shall be?"

"He who plants a tree,
He plants a love;
Heaven and earth help him who plants a tree,
And his work its own reward shall be."

Our report for 1890 I cannot help from calling your attention to. It will stand as one of the best we have ever issued, and one which has received the praise of hundreds of our best people, not only horticulturists, but many others. Fruit-growers, other State societies, florists and scientists all speak in praise of the work.

The "Outlines" of Miss Murtfeldt has received many and many a word of praise from those who know its value. I am sure that you will bear me out in the fact that no other State society ever presented in its report so valuable a report as these "Outlines" furnish. Miss Murtfeldt deserves the thanks and the best wishes of the whole people of the State for her successful work in this direction. I hope this State will recognize the value of the work and the value of all Miss Murtfeldt's efforts, and very soon arrange to pay her for all this valuable information.

I speak the sober truth when I say that other states have paid thousands of dollars for the very same service which our State has been receiving gratuitously. I have had calls for this report from England, France, Germany, Russia, Australia, Canada, from Auckland, New Zealand, and every State in the Union. I shall take the liberty of giving one or two letters which I have received:

FINGAL, October 21, 1891.

L. A. GOODMAN, Westport, Mo.:

SIR—Some time ago I received from you the thirty-third annual report of the State Horticultural society. In reply I can say after giving the said report a careful perusal, that it is one of the best reports I have ever read, and I consider it a valuable volume on horticulture. I would like, if you feel that you can spare them, the reports of your Society commencing with the year 1883, or the twenty-sixth annual meeting, up until the year 1890. Please send bound volumes, as they are for library use.

Yours, etc.,

CHAS. R. STEVENSON,

Fingal Postoffice, Ontario, Canada.

Agricultural editor of Southern Counties Journal.

SACRAMENTO, CAL., October 19, 1891.

Mr. L. A. GOODMAN, Westport, Mo.:

DEAR SIR—I take pleasure in acknowledging the receipt of the Thirty-third annual report of the Missouri State Horticultural society. The report was received some days ago, through your courtesy, and, upon examination, I cannot refrain from complimenting you upon the order and thoroughness of it, as well as its great value.

We Californians never admit that we can be excelled in anything pertaining to horticulture, I believe, but we can perhaps acknowledge that in getting up a horticultural report Missourians are "next best." In fact, your work compels this acknowledgment.

Thanking you for the book, and assuring you of my appreciation of it, I am

Yours very respectfully,

ELLIS R. TAYLOR,

724 J street.

HONORARY MEMBERS.

Some valuable members of our State Society should receive mention, and I have but to call to your attention the names of many of our Missourians to satisfy you that they are entitled to honor. I am not one of those who believe in honoring men of other States and men away off in some foreign land before our own people.

The veteran horticulturist, Judge Samuel Miller, has been before us for years, and first of all he should receive honor at our hands.

The landscape gardener who planned and planted Lafayette park and Forest park, Prof. M. G. Kern, should certainly have his work recognized.

The grape-grower, who has taken so much interest in Missouri grapes, and done so much to advance the work, Hermann Jaeger, deserves it also.

The best worker in entomology in our State, one who has so unstintedly given her time and services to our Society, deserves more than State recognition; Miss M. E. Murtfeldt is the lady.

The Missouri boy, who began his work in the green-houses at Columbia, and is now at the head of the Department of Pathology at Washington, certainly deserves all the honor we can give him—B. T. Galloway by name.

The oldest horticulturist in the West, one who has spent sixty-seven years in producing new varieties of grapes for the western grower; one who is as earnestly in love with his work as ever mortal was; one who has given us the Jewel grape—John Burr, of Leavenworth, Kansas—although not a Missourian, yet living so closely and identified with our work so much, should be honored indeed as much as is in our power.

Our Agricultural college and Experiment station is doing something of what should be done, but never what would be done, if the whole thing were moved to some more congenial location. It is coming to be the opinion of thousands all over our State that the true work of the college and station will never be done where it is, and that the sooner it is moved the better. There seems to be but little sympathy or encouragement to this department of the University among the people of Columbia or of Boone county.

Over \$30,000 income, as the college and Experiment station receive, should make a showing of four or five hundred boys at work in the class-rooms.

The Horticultural department should have a new green-house second to none in the country for experimental work. We should have a dozen sub-stations in all parts of the State working in unison with the college and station, and giving us results worth thousands of dollars to the fruit interests of the State.

Cannot this State afford to put this work in the right place and on the proper footing? Verily it seems to me that the time is here when our college should be second to none in the land.

But lest I weary you, I must cut these thoughts off. So much needs to be done and so many fields seem to open when you begin to examine into the work, that we hardly know where or when to stop. But, my friends, if I have opened up any new avenues, or brought out any new thoughts, or made you value our profession more, or touched a sympathetic chord, or have shown you where you may do valuable work, or where you can improve in your work, or awakened you to a love for this work, or even shown you where you can make any dollars, or earn any honor, I am content.

L. A. GOODMAN, Sec'y.

C. C. Bell—We are now nearing the end of our session. I don't wish to waste your valuable time. I notice that much of our time is taken up by long essays (a voice "and speeches"), which are valuable when printed, but they take the time that should belong to the discussions. We ought to discuss the question of spraying and other useful things. The ornamental part is very nice, but the practical should not be lost sight of. I make it as a suggestion to our Secretary in preparing a program for our subsequent meeting, that he request the essayists to limit their papers to fifteen minutes. This thing of sitting for a half hour listening to something very nice is killing time. I think we are branching off on too many side issues. In the future we should guard against these long essays.

J. C. Evans—The next question is that of the place for the next meeting of the Society.

Chillicothe, Carthage and Sedalia asked for the next winter meeting.

Pertle Springs, Lamar and Lebanon asked for the summer meeting. The subject was referred to the Executive committee.
Music.

J. C. Druffy, Shaw's garden—We commenced last year to spray for the Codlin moth. We used one pound of Paris green to 200 gallons water, spraying twice at an interval of two weeks. The application

was successful. We found one wormy apple to 370 where we sprayed. In those not sprayed we found 48 wormy apples in 370. I believe Paris green is better than London purple. The purple is soluble to some extent, and burns the foliage worse than the insoluble Paris green.

I have heard that lime decreases the amount of injury and allows you to increase the strength of the solution without burning the foliage. Use three or four pounds of quicklime in one hundred gallons of water. As to spraying plums, I can give you no information. Some people claim good success and others had none. The past season we jarred for the curculio and found only three. There seem to have been very few this season. If we had sprayed for them, we would have called it a success.

Black-rot of the grape is a fungus disease. You cannot cure it; you can only prevent it before it attacks the grape berry. The spores of the rot fall upon the fruit and cause rot. They send their roots, as it were, into the fruit and grow at the expense of the fruit, somewhat like a mosquito feeds upon the person. Copper sulphate will kill the spores and prevent the black-rot. In Shaw's garden in the city there is no black-rot. I went outside the city to a small vineyard which had produced no grapes on account of the rot. A part of the vineyard was sprayed, and part was left without spraying. I have here drawings of two bunches of Concord, one from the sprayed portion and the other from the unsprayed part of the vineyard. We sprayed these vines on May 8, May 26, June 15, July 2 and July 15. If I were spraying on my own ground, I would have sprayed sooner and later than the dates given. As I had to go several miles, we could not always find time to attend to it.

The first spraying was with Bordeaux mixture, six pounds of blue-stone, four pounds of quicklime to twenty-two gallons of water. First take the blue-stone and dissolve it in sixteen gallons of water by putting it in a bag of some open material, and suspending it in the water. Slake the lime and strain it so it will not clog your nozzle. Pour the lime into the copper mixture slowly, stirring constantly. This mixture does not injure the foliage of the grape. Prof. Clark says it will burn the foliage of fruit-trees.

I will give you the formula for the ammoniacal solution of carbonate of copper.

Carbonate of copper 3 ounces, ammonia quarts, 22° Baume. Dissolve the 3 ounces of carbonate of copper in the ammonia and dilute

to 22 gallons of water. This solution prevents rot, and does not soil the grapes. We applied it with a Galloway knapsack sprayer, using a Vermorel nozzle.

We have not sprayed for the apple scab.

It is the opinion of Prof. Clark that the Bordeaux mixture will prevent the black-rot of the apple if it is commenced soon enough.

Sam'l Miller—The pump used for spraying may be a very useful thing to have in case of fire and for many other purposes on a farm.

Mr. Barnes—The Field force-pump that is sold for twelve dollars is a good one for spraying. It will throw a stream thirty or forty feet. The Vermorel nozzle is good for spraying vineyard or small plants, but it is too fine to throw a spray to the top of a large tree.

S. W. Gilbert—A word of caution: I sprayed over a thousand peach trees, and killed the leaves, the peaches and a number of the trees. You must be careful. The spray should be fine; there should not be any drops. A very small quantity evenly distributed is sufficient. I would now use one pound of Paris green to 480 gallons of water. I sprayed my peaches for the curculio, which stings the peaches.

N. F. Murray—I first used white arsenic. It burnt the foliage somewhat, but it was beneficial. I next used London purple, which did not harm the foliage.

Mr. President, I believe in giving some honor to a man while he lives. John Burr, of Leavenworth, Kas., has done a great work for horticulture in originating the Jewel and Ideal grapes. He is ninety-one years old to-day. I move that he be made an honorary member of this Society.

L. A. Goodman—I move that M. G. Kern, Sam. Miller, Miss M. E. Murtfeldt and Hermann Jaeger, and also John Burr, be made honorary members of this Society. Carried unanimously.

INSECTICIDES AND FUNGICIDES.

During the past two seasons we have been making at the Missouri Botanical garden some experiments with insecticides and fungicides. While we have made no new discoveries in either line, the results of our work may be of some interest to the members of this Society, and I hope that the discussion will throw more light on the subject than the paper.

In the spring of 1890, as soon as the petals had fallen, we sprayed our apple trees with Paris green, one pound to 200 gallons of water. Our trees are old, some of them about forty feet, and we found it difficult to throw a spray to the tops of them. A Florida spraying-pump with ten feet of hose was used. The hose was made fast to a pole and held up as high as it would reach. The spray could not then be thrown to the top of the trees. This pump may do very well for spraying potatoes and cotton, but for spraying tall trees it is not a success. The next day after the trees were sprayed, we had a heavy rain. Two weeks later the opera-

tion was repeated and was followed by another rain. A few trees were left each time as checks. Examinations of the fruit were made from time to time. No difference in the number of wormy apples was found from trees that had been sprayed and from those that had not. When the apples were half grown, about 48 per cent on all trees were wormy, and when ripe, one without a worm was rare.

This year we repeated the experiments under more favorable conditions. The strength of the mixture was increased to one pound to 160 gallons of water. The hose was lengthened to twenty feet, so that there was no difficulty in reaching the tops of the trees. The first application was made May 4, just after the petals had fallen. Every tree but one was sprayed. The trees were again sprayed May 15.

July 22, from one tree of Red June apples, 18½ bushels were picked; 370 apples were carefully examined and only one found wormy. The same day the apples on the check, a seedling, were examined and 48 per cent found wormy; 300 Genetings examined at picking time contained seven wormy apples, and 300 Winesaps gave ten wormy apples.

Next year I shall spray three times, and shall increase the strength to one pound to 150 gallons of water for the first, and use a weaker mixture for the second and third. We have had no damage to the foliage from spraying. The mixture must be kept from settling, thus increasing the strength.

THE ROSE SLUG.

For many years the rose slugs have destroyed the foliage of our rose bushes, leaving only the dry, brown skeletons of the leaves to disfigure our grounds. Last year a careful watch was kept for this pest, and as soon as the eggs began to hatch the bushes were divided into four nearly equal parts, and treated as follows: Division 1, with 1 pound of whale-oil soap, 1 pound of sulphur and 5 gallons of water; division 2, with 1 ounce of white hellebore in 3 gallons of water; division 3, with ¼ of an ounce of Paris green in 10 gallons of water; and division 4, with ½ an ounce of Paris green in 10 gallons of water. Results: Slugs all killed and no damage to the foliage, while on a few bushes left as checks not a green leaf was to be seen. There was no difference in the condition of the four divisions treated. Each mixture did the work thoroughly. The whale-oil soap and sulphur mixture was the most expensive, and the weaker Paris green mixture was the cheapest. I prefer the hellebore, as costing less than the soap and sulphur, and being less disagreeable to handle, and there is no danger of poisoning from it. The bushes were all treated with hellebore for the second brood. This year all the rose bushes but two were treated with hellebore as before. There were no slugs on the treated bushes, and no leaves on those not treated. The mixture was applied with the knapsack spraying pump, with the nozzle turned so as to play against the under-side of the leaves. Hellebore is equally effective against the currant and gooseberry worm, and may be safely used on cabbage and cauliflower for the cabbage worm.

BLACK-ROT OF GRAPES.

(*Leotardia Bidwellii*, Viala and Ravaz. *)

* *Physalospora Bidwellii*, Sac.

Phoma uvicola, Berkley and Curtis.

Sphaeria Bidwellii, Ellis.

Sphaeropsis uvarum, B. and C.

Phoma uvarum, Sac.

Nemaspora ampellicida, Engleman.

Phyllosticta labruscæ, Von Thuemen.

Phyllosticta viticola, B. and C.

Ascochyta Ellissi, Von Thuemen.

Sphaeria viticola, Curtis.

Sacidum viticolum, Cooke.

Phoma ustulatum, B. and C.

Phyllosticta ampelopsidis, Ellis.

Grape culture has been badly crippled and in some sections almost destroyed by several fungous diseases, chief among which is the disease known as "Black-rot." This fungus was introduced into France from this country, and there the first hints toward discovering a preventive were discovered. Prof. P. Viala and M. L. Ravaz made careful studies of this disease, the cause of which had been made many years previous by Dr. Engleman. The results of the study of Viala and Ravaz were published in 1886 in a pamphlet, "The Black-rot." In 1887 Prof. Viala was sent by the French government to this country for the purpose of making a further study of the disease on its native soil. Prof. F. L. Scribner, who had already done some valuable work on this fungus, was directed by the Secretary of Agriculture, Norman J. Colman, to assist Prof. Viala in his work, which was as important to our grape-growers as those of France. Since then both the French and our own government have made extended experiments on this and other fungous diseases of the grape. Some valuable results have been attained, a part of which I hope to be able to put in available form for the use of the members of this Society. I shall not give long tables, nor detail the many experiments that have been made, but shall confine myself to the most simple directions for applying the mixtures that have given best results, and by a few drawings to show the results of my own experiments, and something of the mode of life of the fungus causing the disease.

Fungi are plants which grow on either living or dead animal or vegetable matter, not being able to make use of the food material found in the soil, as do other plants. They are therefore either robbers or scavengers—the former being called parasites, the latter saprophites. A few fungi, among which is the black-rot, are both parasitic and saprophitic. It grows on the living tissues of the grape until the grape is dead, and then continues to grow on the dead tissue, thus wholly destroying the fruit.

REPRODUCTION OF AND GROWTH OF THE FUNGUS.

Fungi, unlike the higher plants, produce no flowers or seeds, but are reproduced by spores. However, for the sake of simplicity, we may consider these spores as seeds, since they grow and produce plants. The black-rot fungus produces three and perhaps four kinds of spores. Little brown spots appear on the leaves of the diseased vine. In these spots and also on the diseased berries little pimples or pustules are formed, within which are cavities filled with spores or fruit of the fungus. Figures 6 and 7, plate I, show section highly magnified through these pustules, with spores issuing from the openings. These are the summer spores, which propagate the disease through the growing season. They are as small and light as the finest dust, and are blown about by the wind from place to place. They fall on the leaves and fruit of the grape-vine, and if they find moisture and the right temperature, begin at once to grow, forming minute plants, which are shown highly magnified at figure 5, plate I. These plants soon enter the tissue of the leaf or berry, and nothing more is seen of them until other pustules are formed, in which are born more spores. A part of one of these plants, highly magnified, is shown at figure 5, plate I.

Other spores are formed on little protruding stalks, as shown at figure 9, plate I. Later in the season other spores are formed in similar appearing pustules. These spores are inclosed in little sacks, two of which are shown highly magnified at figure 10, plate I. Above are seen four spores as they appear after leaving the sacks. These are the winter or resting spores, which are to give the disease a new start the following year. If we were to imagine thousands of diminutive vines growing wholly within and feeding upon the tissues of a single berry, we would have something similar to the manner of growth of the black-rot fungus. This is an important fact to be kept in mind by all who would combat this destructive disease, for when the little robber is once well established within the berry, leaf or young wood of the vine, it is beyond reach of all substances that do not destroy the foliage and fruit.

TREATMENT.

As will be readily seen from the nature of this disease, there can be no remedy; however, it is not a case of "what cannot be cured, must be endured," for what cannot be cured may often be prevented, and this is true of black-rot, and also of several other diseases of the vine.

Remove and burn all rotted berries, all the leaves and the wood removed by pruning. By so doing, many of the winter spores will be destroyed. Certain chemicals have been found to prevent the growth of black-rot spores, but, owing to the plant being wholly within the host, have no effect on the disease after it has become established; therefore these mixtures must be used early and often. Spray the vines with a strong solution of sulphate of iron before growth begins; also give the stakes, trellis or other support of the vine a liberal spraying. Fifty pounds of sulphate of iron to twenty-four gallons of water have been used. I have not used the sulphate of iron, and should not use so strong a solution. I think that one pound to one gallon would be strong enough. The original Bordeaux mixture contained sixteen pounds of blue-stone in twenty-five gallons, but now only six pounds are used, and by some only two. As soon as the first leaves appear, spray with Bordeaux mixture, and repeat the operation every two weeks until the fruit begins to color. As the Bordeaux mixture, if applied late in the season, may, by adhering to the fruit, make it unsightly, ammoniacal carbonate of copper may be used for the last two treatments.

FORMULAS.

Bordeaux Mixture.—Blue-stone (copper sulphate), 6 pounds, dissolved in 16 gallons of water in a wooden vessel. The blue-stone will dissolve much sooner by suspending it in a loose cloth near the top of the water. Quicklime, 4 pounds, slaked as for mortar, and dilute to 6 gallons; when the lime water has cooled, add slowly and with constant stirring to the blue-stone solution.

Ammoniacal Carbonate of Copper.—Dissolve 3 ounces of carbonate of copper in 1 quart of liquid ammonia, strength 22° Baume, and dilute with 22 gallons of water.

These mixtures must be applied to every leaf and berry in a fine spray. It cannot be dashed on from a vessel or sprinkling can, and must not be put in tin or iron vessels, as the copper dissolves the tin and iron. A copper pump with a Vermorel nozzle is about the only machine that will do the work well.

OUR OWN EXPERIMENTS.

The grape-vines at the garden were treated according to the above directions in 1890, but as there were no signs of any of the fungus diseases on those left as

checks, nothing was learned from the experiment. Black-rot will probably never be troublesome in St. Louis. This is probably due to the smoke from the great quantities of soft coal burned here.

This year a part of the vines on Lackland farm, about twelve miles northwest of the city, were treated three times with Bordeaux mixture and twice with ammoniacal carbonate of copper. The first application was made May 8, and others followed at intervals of about two weeks, the last being made Aug. 7.

The vines treated were on high, well-drained ground. They were trained to arbors, had been well pruned, and were vigorous and healthy. Mr. Lackland told me that the rot had destroyed his grapes for a number of years. The rot was not as bad on the untreated vines this year as it had been for several years. The disease did not appear until the fruit was nearly grown. Figures 1 and 2, plate II, show the most affected bunches from sprayed and unsprayed Concords.

Figure 3, plate II, shows average condition of same variety from an adjoining farm from untreated vines. Figures 1 and 2 show average condition of Catawbas as sprayed and unsprayed vines at Lackland farm. The rot had entirely destroyed the grapes on the vines for several years, and as will be seen by the illustrations, the fruit was again wholly destroyed on the untreated vines, while on the treated vines a fair crop was secured. There were very few bunches of Concords not affected on the untreated vines, and not more than one-third were marketable, while on the treated vines not more than one-tenth of the bunches were unmarketable, and at least one-half were entirely free from rot. One or two more treatments would probably have almost entirely prevented the rot on the treated vines.

Our experiments have confirmed the results obtained by the Department of Agriculture, which show that from 75 to 90 per cent of the crop can be saved by proper treatment with the copper mixtures.

OTHER FUNGOUS DISEASES OF THE GRAPE.

There are other fungous diseases of the grape, most of which yield to the same treatment as that recommended for black-rot. These are known as Anthraknose (*Sphaceloma ampelinum*), brown-rot and downy-mildew, both of which are caused by the same fungus (*Peronospora viticola*); bitter-rot, white-rot and powdery mildew (*Uncinula ampelopsidis*).

I have avoided, as far as possible, the use of technical terms, and have not given any of the many detailed experiments that might have been brought forward to show to what extent these diseases are prevented by spraying. Those wishing to study further into the subject are referred to F. Lamson Scribner's little book "Fungus Diseases of the Grape and Other Plants and their Treatment," published by J. T. Lovett company, Little Silver, N. J., and to the bulletins of "The Section of Vegetable Pathology of the Department of Agriculture," Washington, D. C., which may be obtained by addressing B. T. Galloway, chief of the section.

BIRDS AND PAPER BAGS.

While we have no black-rot in the garden, we have many birds which know when the grapes are ripe. They do not wait until a cluster is ripe, but take each berry as soon as it is ripe enough to suit their taste. Figure 4, plate I, shows an average bunch of Delawares as grown unprotected in the garden in 1890. Figure 3, plate I, shows average bunch protected by paper bags. The bags also keep off insects and rot if put on as soon as the fruit is set.

SPRAYING APPARATUS.

The most convenient machine for spraying grapes and other low plants is the knapsack sprayer. Any machine in which the copper salts are used must be made of copper: an iron pump will not do as, it would soon be ruined by the action of the chemicals. Wm. Stahl, of Quincy, Ill., carries a full line of spraying pumps, and will gladly furnish any information about them.

J. C. DUFFEY,
Missouri Botanical Garden, St. Louis.

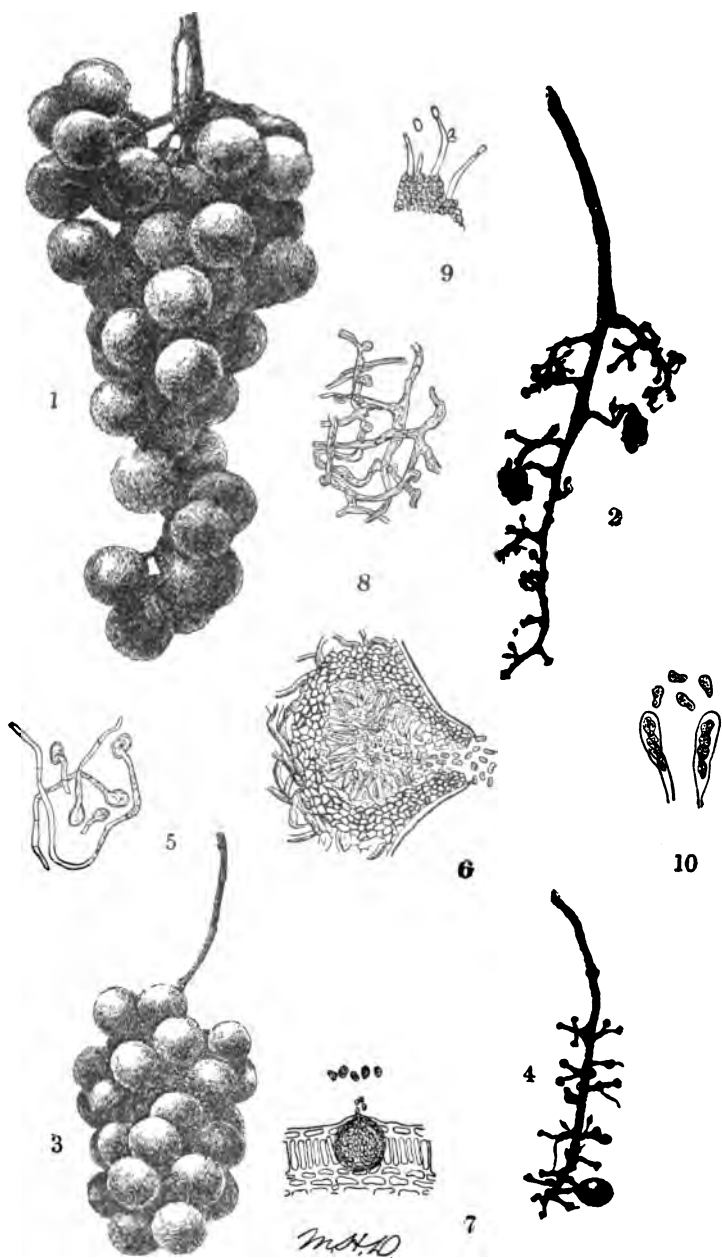


PLATE I.—BLACK-ROT AND BIRDS.

EXPLANATION OF PLATES.

PLATE I:

- FIG. 1. Average bunch of Catawbas from sprayed vines.
- FIG. 2. Average bunch of Catawbas from unsprayed vines.
- FIG. 3. Average bunch of Delawares protected by paper bags.
- FIG. 4. Average bunch of Delawares unprotected, the berries destroyed by birds and insects.
- FIG. 5. Spores of black-rot fungus after germinating.
- FIG. 6 and 7. Highly magnified sections through the pustules of black-rot, with spores issuing from the openings.
- FIG. 8. The black-rot plant (the *mycelium*).
- FIG. 9. Spores of black-rot born on stalks (the *conidia* and *conidiophores*).
- FIG. 10. Two of the little sacks in which the winter spores are born, with eight spores in each sack (the *asci* and *asci* spores). Above are four spores from another sack.

PLATE II:

- FIG. 1. Worst bunch of grapes from sprayed Concords.
- FIG. 2. Worst bunch from unsprayed vines.
- FIG. 3. Average condition of Concords from untreated vines on an adjoining farm.

ACKNOWLEDGEMENT.

PLATE I:

- Figures 5, 6, 7 and 10 are after Scribner, reduced one-fourth.
- Figures 8 and 9 are parts of figures from Scribner.
- Figures 1, 2, 3 and 4 were drawn by Mrs. Duffey from original photographs.
- Prof. F. L. Scribner's little book, "Fungus Diseases of the Grape and Other Plants, and Their Treatment," and the bulletins of the Division of Vegetable Pathology, have been freely consulted in regard to the life history of the fungus.

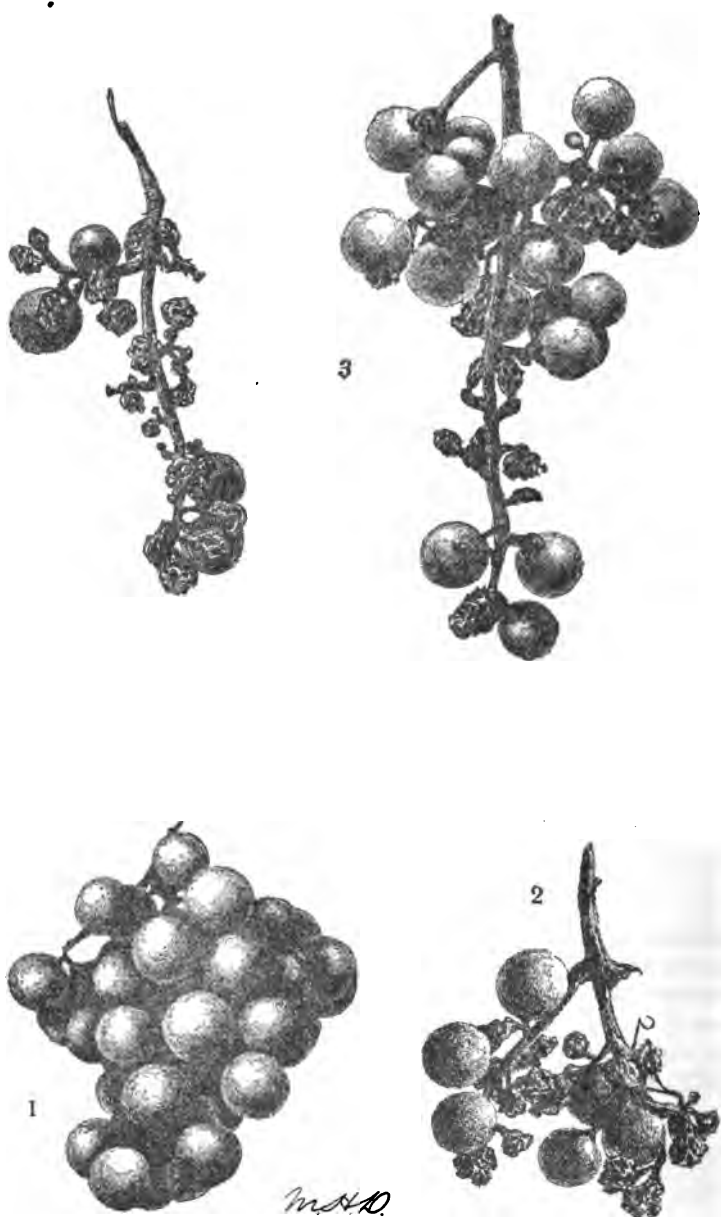


PLATE II.—SPRAYED AND UNSPRAYED GRAPES.

SPRAYING.

Will it pay? is naturally the first question that presents itself for answer in any consideration of spraying. This question is the universal touchstone now-a-days. If it pays to spray, we want to know it, that we may adopt this method of fighting insects and fungi and get our share of the financial reward. If it does not pay to spray, we want to know that, that we may not be led into an unprofitable undertaking. We may be in the business of fruit-growing for our health, but we are also in it for the profit that may be made.

My experience with spraying is probably as extensive as is that of any one in the country, and it has shown me very conclusively that it does pay to spray, and it pays very handsomely. Sometimes it pays 500 to 1,000 per cent. That is certainly sufficiently prosperous. Are you incredulous about that? I can only say that my experience has shown me that a profit of 500 per cent in spraying is by no means unusual, and there are many in this State, some probably present here to-day, that can bear the same testimony.

Profit depends upon the cost of a thing and the results achieved. We will first consider the cost of spraying. It is inconsiderable. Fortunately no one need be deterred from spraying by the cost. In spraying there are three important mixtures used. Other things are used, but these three mixtures are used much more than all other things put together, and many fruit-growers, perhaps a majority, will never have occasion to use anything other than these three mixtures. For the sake of brevity I will consider only these three. They are the Bordeaux mixture, the London purple solution and the kerosene emulsion. The kerosene emulsion is used to prevent the ravages of hop-lice, squash-bugs, leaf-hoppers, aphids, bark-lice, chinch-bugs, etc. It is made by dissolving, by boiling, one-half pound of hard soap in four pints of water. To this is added a gallon of kerosene, and the whole is agitated briskly until a stable mixture is formed. The agitation is best accomplished by using a force-pump and pumping the mixture with force back into the vessel that contains it. This emulsion is ordinarily diluted for use by adding ten to twelve parts of water. It may be diluted and used at once, or it may be allowed to stand and be diluted when needed.

Now, as to the cost of it: Only the best whale-oil soap should be used, but it costs only fifteen cents per pound. A pound of the soap and two gallons of kerosene, total cost forty to forty-five cents, will make thirty gallons of the emulsion diluted for use. Not taking into account the light labor required in its preparation, the cost of the emulsion, ready for use, is less than two cents per gallon.

The second of these three important remedies is the Bordeaux mixture, made as follows: Dissolve six pounds of sulphate of copper (blue vitriol) in sixteen gallons of water. In another vessel slake four pounds of lime in six gallons of water. When this has cooled, pour it slowly into the copper solution, being careful to mix the fluids thoroughly by constant stirring. As to the cost of this, the water, of course, costs nothing, and one hundred pounds of the copper sulphate will cost only seven cents per pound. The Bordeaux mixture is used for the black-rot of the grape, for pear and quince leaf-blight, and for potato blight or rot. To spray with it the average vineyard will cost, per spraying, for labor and material, including the cost of putting it on, not more than \$1 per acre.

The third, and most important, of these remedies is the London purple solution, the remedy for the codlin moth, canker-worm and curculio of the plum, etc. It is made by mixing London purple with sufficient water to make a paste. This is stirred thoroughly into a pail of water and allowed to stand over night. The

contents of the pail are then strained through a fine sieve or a coarse cloth into the distributing tank or barrel containing water. There should be from 140 to 150 gallons of water for each pound of London purple. The pound of London purple will cost twenty cents, and fifty gallons of the solution will spray an acre of the average orchard.

Mr. E. D. L. Evans, of Houseman, Mich., writes me that with my barrel sprayer, which requires one man to operate it, he sprayed his ten-acre orchard between 8 o'clock in the forenoon and 3 in the afternoon, using 8 barrels of solution. It is easy to see that this spraying did not cost 20 cents per acre for material and labor. Mr. Evans says: "Our orchard is the only one that has any fruit on at all." Mr. Frank Wellhouse, Fairmount, Kas., the largest apple-grower in the country, writes: "We sprayed 180 acres twice, equal to 320 acres once, and 277 acres three times, equal to 831 acres once, or a total of 1,115 acres at a single spraying. To do this we used 60,000 gallons of water and 600 pounds of London purple, and it took 46 days to do the spraying, so that the expense stands thus: 46 days with team at \$2.50 per day, \$115; 600 pounds London purple at 10 cents a pound, \$60; total, \$175, or a little over 15 cents per acre and about 1½ mills per tree for each spraying.

As already appears, it is necessary to spray more than once. A little information about the times of spraying will be necessary to determine fully the cost of spraying each orchard or vineyard, and with this information we will also have nearly all the information necessary as to how to spray. To prevent the black-rot of the grape by using the Bordeaux mixture, spray in the spring after the vineyard has been pruned and put in order, but before vegetation has started; again about ten days before the flowers open; the third time when the flowers are opening, and from this time on every three weeks until the fruit begins to color. To destroy the codlin moth, canker-worm or curculio of the apple by using the London purple solution, spray soon after the blossoms have fallen. To prevent leaf-blight of pear and quince, begin in March and spray every three weeks until August 1. It will be seen that not many sprayings are required, and that the cost is insignificant when compared with a heavy yield of perfect fruit.

There is one item in the cost of spraying yet to be considered—the pump. A good pump does not cost a large sum, but I must warn you not to buy a low-priced pump, by which I mean one costing four or five dollars. You cannot reasonably expect to get a serviceable pump for that amount, and you can rest assured that you will not get such a pump unless you pay a reasonable price for it. Of all the vexatious things in this world, a spraying pump that won't spray deservedly stands near the head. Inferior pumps that would not work, or that would not do good work, have done more than all things else to retard the spread of spraying and the consequent freeing of our orchards and vineyards from insects and fungi. For spraying vines, shrubs, etc., a knapsack sprayer is best, and a good one can be got from \$12 to \$15. For spraying trees a barrel pump is required, and a good one can be got for from \$12 to \$13 up. Some complete tank sprayers sell as high as \$75, and are worth it. A good pump, used with reasonable care and stored properly when not in use, will last for years, so that the pump adds scarcely anything to the cost of spraying.

Finally, what do we accomplish by spraying? Doubtless you are familiar with the reports of experimental stations, and especially with the reports of the Department of Agriculture, and without doubt this intelligent body reads horticultural papers; hence there can hardly be any question among you that by spraying we can prevent the ravages among our fruits of those insect pests and fungous diseases that have proved so destructive.

But, while I have the greatest confidence in the experimental work of the Department of Agriculture and of our State experimental stations, I much prefer to have the experience of actual, practical fruit-growers, whose experiments cover, not a few feet, but acres, and who must pay for their experience out of their own pockets, hence are apt to be conservative and safe in their conclusions. I apprehend that you are of the same disposition. Hence I will quote from a very few of the letters I have received from fruit-growers in this State. I have letters from above one thousand fruit-growers that tried spraying the past season, and their universal testimony is that it accomplishes all claimed for it. But time forbids that I should quote from more than half a dozen of these letters.

Says Isaac Smalley, Haw, Pike county: "It was too wet to give it a fair trial. We never got to spray but once on our trees. We sprayed about six hundred trees and the apples look fine. Apples left unsprayed in the orchard are full of worms. I can't recommend it too highly."

H. W. Sherman, Neosho, Newton county: "I received two wagon loads from an orchard yesterday that was sprayed, and there was not a peck of wormy or specked fruit in the two loads. I purchased the fruit from the same orchard last year, which was not sprayed, and there was not over three bushels of sound fruit to the load."

Thomas Jobson, Macon, Macon county: "I sprayed about six hundred apple trees. The fruit is fine and almost entirely free from worms. I have a few trees that on account of location I neglected to spray, and the apples on those trees are badly injured on account of wormy apples."

A. J. Park, Virginia, Bates county: "I sprayed over a thousand Wild Goose plum trees. All parties using my plums were led to remark that they did not find any worms in the plums, as they did in other plums of the same kind. I found but few under my trees that had fallen off from being stung."

W. A. Huntsman, Lawson, Ray county: "On trees I sprayed this spring the apples are very much nicer than those not sprayed; only about one-fourth as many wormy apples on them as on those I did not spray."

D. Bartlett, Bracken, Webster Co.: "I sprayed some Early Harvest apples, and there were but few wormy apples. Last year could hardly find a sound one. Also sprayed Ben Davis, with the same result."

H. C. Lyle, Winchester, Clark Co.: "We did not have one sound apple last fall; all had worms and rotten cores. This fall I have not found a single apple with worms or rotten core; all are sound and thrifty."

Lindon Marts, Grovedale, Maries Co.: "Gave my orchards three sprayings. The fruit is fine and large; no worms, while those not sprayed are small, wormy and knotty. My trees have made fine growth. I consider that the outfit has well paid for itself on my potatoes and cabbage alone. For the cabbage worm I used Paris green—one pound to 400 gallons of water—effectually getting away with the cabbage worm."

S. T. Talcott, Mountain Grove, Wright Co.: "We saved a valuable apple tree which was being ruined by the blight, and took the curl out of my peach trees; also gave new life and vigor to decaying rose bushes."

John F. Schultz, Canton, Lewis Co.: "The first I sprayed were grape vines, and also young pear-trees. Of grapes I will say, had it not been for the spraying I would have had no fruit, as I tried it thoroughly by leaving, of all the varieties I had, some unsprayed, which lost at least ninety per cent of their fruit by black-rot. Where I did spray I saved, from Concord, a full half crop; Martha, the same; Elvira, at least ninety per cent, and Norton's Virginia seedling, no rot at all. I

will say here that I could have saved more Concord had it not been for the very unfavorable weather for grapes—rain nearly every day—and having so much work to do, it was impossible for me to get around in time. Furthermore, I did not commence quite soon enough, as I consider spraying a preventive, and not a cure. I also sprayed a few young pear trees, and they held their foliage nicely, while the season before this they lost nearly all their foliage. This fall I tried the Bordeaux mixture on an old strawberry bed where the leaves had the rust, and I notice the good result already."

I might multiply these, but it can not be necessary. I have already taken so much of your time that of my own experience I will only say, that I have been experimenting in spraying for eight years, and have sprayed extensively the past two years, as I have 300 acres in fruits, and have proven to my own satisfaction that it pays to spray every vine and tree that one has; that it will pay to spray on account of the greater health and thrift of the tree or vine alone, not to speak of securing large crops of perfect fruit. The editor of the "Farmers' Call" said last September, after a visit to my fruit fields: "Certainly if we could take the farmers and fruit-growers of this country to Mr. Stahl's fruit farms, and show them the effects of spraying that we saw, every intelligent man among them would have a spraying outfit before another season, and would no more think of failing to spray his fruit-trees and plants than he would of failing to cultivate his corn or potatoes."

Missouri is one of the greatest and grandest States in the Union. It may well be asked if its wonderful combination of agricultural and mineral wealth, its central location, and its situation as regards the natural means of internal commerce, will not in time make her the greatest among the sisterhood of States. She has marvelous possibilities in fruit-raising, and her rank as a fruit-growing State is among the very first. I am sure that the horticulturists of this great State can not do anything that will more advance their individual interests and the horticultural development of this empire State, than by putting this new art of spraying into use in all their orchards and vineyards.

WM. STAHL, Quincy, Ill.

REFRIGERATOR CARS.

The unsolved problem which confronts the fruit and vegetable-grower and shipper is that of safe and profitable transportation.

The commercial fruit-grower must avail himself of all the markets of the United States and Canada to find a profitable market for his product. I mean by the commercial grower the one who looks upon his avocation as one of possibilities beyond the mediocrity of his local surroundings, upon which most beginners depend for a market. Every trade center in the United States and Canada is open to the Missouri, Kansas, Arkansas, Texas, Georgia, Tennessee or Florida fruit and vegetable shipper, if he only reaches out, in a business way, to reach it.

When we consider that Chicago alone received and distributed 6,000 cars of fruits in 1890, the oft-repeated prediction "that there was an over-production of fruits" is proven a fallacy. When we learn that one district in Tennessee shipped 400 cars of tomatoes and strawberries this spring, and another 300 cars in Mississippi, and from four towns in Arkansas 84,000 packages or 282 cars went out this season at a good profit, our hopes for the future and a better day for the horticulturist, the home builders of America, should end in fruition.

The food product of the United States is now, wheat first, meat second, corn third and fruit fourth. If the producers of bread and meat were confined to local

or near-by markets alone, agriculture in the West would indeed be on its last legs. The markets of the world are now open as wide to the fruit-grower as they are to the Minneapolis millers.

This problem has been solved and this condition attained through the perfection of the refrigerator cars, making fruit and vegetable transportation a specialty. During the season just passed the American Refrigerator Transportation company loaded tomatoes in Arkansas that went to Toronto, Canada, and berries from St. Louis to Montreal. Every trade center in the United States is available by this science, which is so imperfectly understood by so many fruit-growers. It seems to me that now since the science of production has made so much progress, there should be some attention paid to the science of marketing. After the grower has rescued his crop from the calamities that come in the natural way, such as bugs, drouths, you are confronted by the transportation problem. I find that the special need of successful fruit shipping is not alone confined to the railroad managers, but more than half the growers seem to have no definite or well-defined idea of his needs, and a suggestive remedy, because of his ignorance of transportation economy. We often hear the most bitter denunciation of railroad managers, who wait to hear, learn and correct any abuses that may exist, if they are intelligently presented. To do this, nothing short of an effective organization of the growers in each district can consummate it. An individual shipper can not load a refrigerator car as a rule, and unless there is an associated effort of a convincing nature, a transportation company can not be expected to provide this special icing arrangement, that takes expert handlers and very expensive preliminary provisions.

I began agitating the subject of fruit transportation years ago, and have preached the doctrine of a closer relationship between the public carrier and the people, because their interests were identical. No railroad can pay dividends operating in a territory devoid of anything to haul. Railroad managers are responsible to stockholders for their stewardship, and are more than anxious to build up commerce on their respective lines of road by fostering any industry of a dividend-paying nature. I have been pretty severe in my paper and on the rostrum in criticising what I call the apathy of railroads in this connection.

Three years ago I conceived the idea of refrigeration of fruits to market our Southwest Missouri products, and found I had struck a subject very few railroad men and fewer fruit-growers knew anything about in the West. But with the tenacity of a country journalist I kept tooting my bazoo and absorbing information from every available source on the subject. I found California and Florida were sending their products from 500 to 1,000 miles further than we of the Mississippi valley in refrigerator cars, and realizing twice our profit in available markets. The science of refrigeration was a new study and few school teachers to teach it, but by dint of perseverance and from every quarter of the globe I absorbed information on the subject. When we began it in Southwest Missouri the railroad people woke up, and the express companies got very wide awake, and a new era dawned upon the fruit industry.

The first season we were met by a combination of circumstances that deters men from perseverance, and came out of it with day-light under the clouds.

The opposition was chiefly from the fruit-grower, who had an opinion of himself akin to Cæsar's wife, and had a local express trade that if his neighbors went to growing berries he thought he saw a division of traffic, and was jealous of his 2x4 reputation as the king-bee fruit-shipper in his balliwick. He did not propose to have anybody manage his business; he felt hurt that his neighbors wanted to grow and ship fruit and get rich.

That year we paid the Refrigerator Car Co. over \$6,000 special ice charge on 39 cars of strawberries.

I was told a few months after I made my report, by Reid Northrop, President of the A. R. T. Co., of St. Louis, carrying the perishable goods of the Missouri Pacific and Wabash railroads, that we had paid fully twice as much as the service could be done for, and his company would do it for half that, and give a guarantee bill of lading.

This took my breadth. The idea of a railroad man opposing extortion was a revelation to me, and I began thinking again. On conferring with these gentlemen, I found them anxious to foster the fruit industry on their lines of road, and anxious to know what the fruit-growers needed from railroads to build up the industry.

In a letter received after this, several months after I had taken charge of their fruit department, Mr. Northrup said: "It is not a subject of making money for this company this year your efforts are directed, but to establish the fact that the refrigerator system is the most practical and best method to ship fruit and vegetables. Our object is to meet the fruit-grower more than half way, and work to his interest."

Well, as I had been preaching this doctrine of a better and closer understanding between the carrier and shipper, I thought I saw the fruit millennium just beyond, and was afraid some Gabriel would toot his horn and bring the judgment before I could get the news before the Philistine, whose hand was raised against his brother. That year, in Arkansas, Texas, Kentucky and Missouri, a hundred cars went north from districts where a refrigerator car was never seen before. Thousands of packages were shipped to St. Louis by express, after the market was relieved by the car shipments to far northern points, that otherwise would have rotted in the fields. One Arkansas grower shipped 15,000 packages or 25 car-loads alone; four towns shipped 84,000 packages or 282 car-loads, and one town sent 9 cars of tomatoes out, some going to Canada.

During the season I organized about thirty fruit and vegetable societies in Texas, Arkansas, Kentucky and Southeast Missouri, who are now planting large acreage of vegetables and fruits for next year's business. In Scott and Mississippi counties 2,080 cars of watermelons were shipped this season, and with their other productions they will soon see the dawn of a brighter era, when the truck farmer and fruit-grower will get his nose off of the grindstone and live in reality beneath his own vine and fig-tree.

On the 23d ult. the Mississippi Valley Fruit and Vegetable Shippers' association was formed at St. Louis. It embraces parts of Missouri, Arkansas, Texas, Kentucky, Illinois and Tennessee. They have a general manager, who will be an autocrat, subject to the executive committee. He will be at St. Louis, and have a man from each shipping station in the society at each city in the United States during the shipping season to look after their business, quote markets, advise about shipments, look after returns, and help the commission man treat the grower O. K. This general manager, who is Capt. D. L. McLoud, President of the State Horticultural society of Arkansas, will make orders for each station to ship, based on telegraphic advices from his own men.

No funny business about the markets will go; each shipper will get his returns promptly or mob their man when he comes home. The different sections divide territory just as the railroads do, and they are getting some rates and concessions by concerted action that is a revelation to the kicker, who said it would not work.

Each local shipping station in every State is properly represented; each shipper gets reports and returns just as if there was no special man on deck. His commission man deals alone with him, but he gets a square report from his special man about his goods and condition of arrival, packing, etc., that will help him at home, while his man stands there and sees what it sells for and who got it. This thing worked last year so well in the management of the Arkansas shippers' union this spring that it made believers of all the Thomases who had to thrust a finger in before he would believe he was saved.

The policy of the grower and shipper getting a closer and better understanding is the only salvation for the small-fruit and vegetable industry. The Refrigerator Car service, operated by an organized fruit-service, is an insurance policy in the form of a way-bill. There are cold-storage rooms to hold the product over from day to day, and the shipper is not at the mercy of an overdone market or a combine.

The science of taking the vegetable heat out of tender fruits and vegetables coming from the warm fields of the South is simple enough when you know how to do it. Then holding the load at an even temperature in transit and taking it out in Chicago, St. Paul, New York or Montreal, is another feature of knowing how to do it. Ice stations, cold-storage rooms, special men in charge, are another feature of the accomplishment. A self-registering thermometer in the car registers the highest and lowest temperature. A load cooled too much is nearly as bad for market as one not cooled enough. Packages of strawberries have been shipped to Denver from Van Buren, Ark., in refrigerator cars, 48 hours in transit, expressed back to Van Buren and opened, and found by the committee to be as good as they were when picked. The shipper who undertakes to load a refrigerator car without experience and a thorough knowledge of the business will get grief instead of business.

J. M. RICE, Sarcoux, Mo.

DISCUSSION.

L. A. Goodman—From the report I am doubtful if fruit shipping in refrigerator cars is a success. We shipped several cars with ice from Olden. Some of them failed completely, though they were packed by a man sent directly from the owners of the cars. I am a little dubious about all this work. When the shipments were made by express we never lost one, though they charged enormously.

J. M. Rice—What of the California shipments?

L. A. Goodman—Did you ever see the fruit in California, and see how they grow, handle and pack it. We don't grow such fruit here. Ours is fit to eat. There is a wide field for experiment and investigation in regard to shipping fruits. I am seeking to find out what can be done and whether it will pay.

A member—Some fruits are destroyed by too low a temperature. Strawberries and other tender fruits should not go below 50° or 60°. Does Mr. Rice know at what temperature the fruit is kept in refrigerator cars?

J. M. Rice—If it goes below 40° you are gone; at about 60° the fruit will go in fine order. The refrigerator car is the only thing on earth that will carry fruit safely to market in the hot season. There are only four kinds of cars in the United States that will carry fruit.

Mr. Perrine—We in Illinois have had some little experience. For four years we shipped almost our entire crop in refrigerator cars. When the weather was fine, and the berries in good condition, they reached market in good condition. The Thomas car has given us the best results. When you are in twelve or even twenty-four hours of market, you can get good results by shipping in good ventilated ordinary cars, which go by the fruit train, which makes the same time as passenger trains. If the berries are in poor condition when loaded, it is impossible for the car to keep them.

J. H. Logan—I am in the fruit business for the money, and not for fun. We want to ship our fruit in the way we can get the most out of it. I know what my experience has been, and give it in my paper without meaning anything personal.

ANOTHER YEAR'S WORK.

NEVADA, Mo., December 1, 1891.

Mr. President and Members of our Horticultural Society:

As our worthy Secretary has not assigned me any subject on the program, and I do not think of any particular part of our work to write about at this late day, I will again report something of another year's work. I feel that it is a great privilege to again have the opportunity of meeting friends that are pursuing the same avocation in life. I presume that we all have the same object ahead of us, to do the best we can for ourselves, and mankind in general. I think that there are a very few that are wholly engaged in horticulture but what are moral and law-abiding citizens, men and women that are always ready and willing to lend a helping hand to their fellow-beings.

I think there is no field of labor grander, or nobler than that of horticulture, and our meeting twice a year certainly affords a great deal of pleasure in exchanging views and relating the successes and failures in our work. We must have failures, for it would not be well for us to succeed in everything; but I have thought sometimes during the past two years that our success has been overbalanced by failures, especially the growers of small fruits. During the past year the small-fruit growers have sustained heavy losses, that may be attributed to several causes. During the early part of the season the strawberry crop looked very promising. Our fruit began to ripen about the 12th of May (here in Vernon county); we began making small shipments about the 16th; the prices received were very low, as compared with prices received at the same dates two and three years ago, but our fruit arrived in distant markets in good condition. I think we had no losses reported before the latter part of May, when the wet weather began to change the results.

We had been shipping by express, as the previous year's experience had dictated to us, to be the safest and surest way to obtain anything like a fair price for our fruit. The A. R. T. Refrigerator Car company offered us their cars. In fact,

I never saw men more persistent in advancing the great benefits offered to the growers and shippers of fruit and vegetables.

But it was very hard work to convince those that had lost so much by the experiment the year before. We were urged very strongly by these men to assist in loading a car of berries for Denver. I finally proposed to them that we would put in our berries, providing that they would advance one dollar per crate as a guarantee that the fruit would go through to Denver in good condition; this they finally assented to. We put seventy-six crates in this consignment, with others enough to fill the car, and a day or two after another car was loaded for Omaha. We put in 103 crates in this consignment. In my absence my sons consented to take fifty cents per crate as a guarantee of safe arrival at Omaha. Well, in a few days, reports came back as I expected from both points, "fruit arrived in such poor condition, but little above charges could be got for it." This ended the refrigerator shipment of berries from Nevada.

I will right here compliment Mr. Rice, the agent for the American Refrigerator Car company, for his efficient work in their behalf.

But our fruit-growers along the line have had to suffer to some extent, just how far I will not pretend to say; but I do know this much: that I attended a called meeting of the Southwest Fruit-Growers' and Shippers' association (held at Lamar, Mo.) just after the end of the strawberry season, and I think every shipper related about the same experience in using these cars as the above.

Now I will not attribute all of these losses to the refrigerator car, or the men who had charge of them, but I am satisfied that as long as they undertake to carry fruit through to distant points on the regular freight trains, just so long will those patronizing them be the sufferers. I would as soon take my chances by freighting through on the overland route by ox teams to Denver.

Our raspberry and blackberry crops were fair. Prices received for raspberries, I think, net about \$1.60 per 24-quart crate, on an average; blackberries, \$1.25 per crate net; Wild Goose plums a fine crop; apple crop, good quality and a fair yield; commission men, fifty per cent above a full crop; frauds, about 100 per cent above the average (no fruit-growers included in the last estimate).

Now, fellow-laborers, I hope that during the past year we have again learned something from a purchased experience, and that we may be benefited by it. I also hope that we may all live to again meet and relate another year's experience. Hope—what a blessed thing is hope; hopes and fears change human life. It has been said, hopes and disappointments "are the lot and entertainment of human life; the one serves to keep us from presumption, the other from despair; hope is the last thing that dieth in us, and though it be exceeding dutiful, yet it is of this good use to us: that while we are traveling through this life, it conducts us in an easier and more pleasant way to our journey's end."

Truly,

J. H. LOGAN.

A PLEA FOR SHOWS.

We live in an age of surprises, and yet we are never surprised, for so wonderfully interwoven and so remarkably connected are the developments and inventions of the times, that each discovery and each striking invention proves to be only the herald of something more remarkable to follow. Thus we are led by gradual approach to expect and receive every remarkable development as something of follow in the natural course of events.

We believe that electricity as a motive power has no limit of application or use. If the street car surrenders to its command, the day is near when the passenger trains and the transportation lines will submit to its control.

In the same manner, evolution and development are continually being manifested in nature's management of plant progression. An improved strain of fruit gives a combination of merits to its successor to produce other and greater improvements, provided always, however, that the germs that go to compose it are of no baser blood than that of the better parent. This in turn, under the management of better cultivation, and by association only with improved lines of fruit, will evolve greater combinations of merit, until we may believe that soon we shall learn of such a union of characteristics in every class of fruits as shall give us flavor, color, size and quality beyond our present ability to conceive.

Even now, some such combination may exist in some varieties of fruits. While we are seeking the coming apple, there may be in some remote portion of our land, unexplored by the enlightened horticulturist and unknown to the adventurous apple-packer, a tree produced from a seed of the Golden Pippin that has mingled its pollen with the flowers of a Ben Davis and extracted the nectar and washed its cheeks in the blood of a Jonathan, luscious, melting, and good from December to May.

In that undiscovered garden there may be grapes that would rival the clusters of Eschol, strawberries more productive than Crescents, larger than Jessies, firmer than Glendales, better than Sharpless. But the proprietor of that wonderful garden might remain forever unknown but for the missionary efforts of an awakened horticultural public.

In the fruit exhibits of a fruit-loving people we have object-lessons of more potent influence than any other known means for the proper information of the young fruit-growers of our day. Better information, more practical and impressive, is accomplished by extensive table displays of fruits, flowers and all products of the garden, than by all the essays of popular and experienced writers.

By fruit and flower shows of perfect specimens, true ideas are conveyed of form, color and flavor.

By such displays proper emulation is promoted, useful tastes are formed and cultivated, correct information of varieties suitable to localities is conveyed, thus avoiding the errors so disastrous to beginners in planting.

By proper nomenclature the novice has a school of information in which lessons easy to read, impressive in character, and enduring in effect, are unmistakably conveyed.

In fruit and flower shows opportunity is afforded for introducing new and unknown sorts to proper tests in different soils and climates, or more speedily removing them from the lists of profitable varieties.

To accomplish all this, however, every true horticulturist should influence all who have horticultural tastes to become members, live working members of some fraternity of horticulturists.

We are now on the eve of preparation for a show that bears a higher relation to all the world than our local exhibits do to a county—a show which all the world will either see or read of.

Shall we, as citizens of one of the most valuable fruit districts on the American continent, sit idly down and let less deserving producers carry off our laurels?

Shall we, whose apples have already won the highest place in all foreign marts, surrender to less deserving competitors?

Let the State of Missouri forbid! We have the material.

We are about to be offered the opportunity to advertise the resources of our State in such a way as to invite and bring within our borders such a tide of enterprising, energetic and industrious citizens as shall double our wealth as a State, and add a hundred-fold to our next census report.

Let us awake to a realization of the value of our opportunity before it is too late, and invite and urge every horticulturist and every agriculturist in the State to put forth every effort at his control, in such a way as to enable us to aid in placing the State of Missouri before the great Columbian Exposition of 1893, where she ought to rank—first in horticulture, first in agriculture and first in mineral wealth.

C. I. ROBARDS, Butler, Mo.

Amendments to the Constitution, adding the office of Second Vice-President, and requiring the Treasurer to give bond, were adopted.

Samuel Miller was elected Second Vice-President.

AMENDMENT TO CONSTITUTION.

Resolved, That the Constitution be amended as follows :

ART. III. That the officers of this Society shall consist of a President, First Vice-President, Second Vice-President, Secretary and Treasurer.

ART. VIII. The Treasurer shall give a bond in twice the sum he is expected to handle, executed in trust to the President of this Association, forfeiture to be made to the Society, provided the Legislature makes the appropriation, with two or more sureties, qualifying before a notary public, of their qualifications as a bondsman, as is provided by the statutes concerning sureties.

The following invitation was read :

To the Delegates of the State Horticultural Society, now in session in Sedalia :

GENTLEMEN—I respectfully extend to your honorable body an invitation to visit the halls of Central business college, in a body or otherwise to suit your convenience, sometime between 1:30 p. m. and 4 p. m. if convenient, and witness some of the exercises.

Respectfully,

C. W. ROBBINS.

Thanks were tendered Mr. Robbins for the invitation, and the members accepted as far as possible.

Telegrams of greeting were sent to the Indiana State society, in session at Indianapolis, the Michigan State society, in session at Eaton Rapids, and North Illinois State society.

NIGHT SESSION.

Music by children's band : "My Fair One."

"How to Grow an Apple Orchard in North Missouri," N. F. Murray.

Vocal music, choir.

"The Mission of Flowers," Mrs. Geo. E. Dugan.

"Bugs," F. A. Sampson, Sedalia.

"Safe in Our Father's Home," vocal solo, by Howard Stryker.

"Insect Architecture," Miss M. E. Murtfeldt, read by A. J. Blake.

"Lessons of the Summer," by E. L. Pollard (17 years old), read by Secretary oodman.

GROWING AN ORCHARD IN SOUTH MISSOURI.

Mr. President, Ladies and Gentlemen:

At first thought, one would naturally think that to write a paper on growing an orchard would be an easy task; any one can do as easy a task as this is.

Mr. President, had I not driven over Laclede, part of Webster and part of Dallas counties this fall, and seen orchards of all ages and under all conditions and circumstances connected therewith, it might have been easier to have put my ideas in the form of a paper to be read at this meeting.

But all that I have seen, all examinations that I have made and questions that I have asked about time of planting, age of trees planted, care of land before and after planting, and if it ever had any care, would cover so much ground that it alone would make a book as large as our Secretary's annual report. Hence it will be necessary to cut short much of my rambling over the Ozarks, among its hundreds of acres of young and old orchards. I have here with me fruits picked from orchards that were planted before the late war, these orchards being planted on timber land fresh chopped off, no plowing done at time of planting, and no plowing, digging or spading done from that time to this; yet this orchard bears good crops of good fruit year in and year out.

Then, again, I have fruit here from trees planted as one-year trees, now four years planted, and planted on thin land, in a meadow, no cultivation of any kind, yet as fine fruit as there is on exhibition here; and one thing more: on the neglected orchards, both old and young, I found fruit more highly colored than in orchards 4, 5, 6 and 7 years of age, that had secured good, fair cultivation each year. This is one thing in fruit-growing that I have not studied out, or else my head is too heavy and stupid to see it.

I did think, away back years ago, when talking on the subject of fruit, that I did know something about it; but now, as I am crowding the 65th mile-post of an active life, I find I am just learning the first letters of the a-b-c in fruit-growing.

But my subject is "How to Grow an Orchard in South Missouri." I wish our Society had put it How I would Grow an Orchard in South Missouri. In that case I would take more chances, and I think I shall take the chances anyway.

To one who contemplates planting an orchard merely for commercial purposes, if he be a young man, 45 years of age or under, and wants to plant 40, 80, 120 or 160 acres, I would advise this course: Let him first consult the most careful and reliable fruit-growers in his locality as to kinds and varieties best suited. Then when varieties are selected, let him apply to some good, reliable nurseryman (provided he cannot do it himself), and have the said nurseryman prepare him root-grafts double or treble in extent to what he intends to plant. Have a good, strong piece of corn ground, or ground that will grow a good crop of corn, prepared to plant out his grafts. Grow your own trees, and why? Because in growing your own trees you can snap your fingers at the dishonest tree-peddlers and their more than dishonest practices.

Again, the year you are waiting for your trees is not really lost, for in some cases you would gain from three to five years, it may be. But better wait a year and know your trees are true to name than to pay from ten to twenty dollars per 100 for trees, wait to get them to bearing, and lo, you have scrubs, seedlings and scallawags; then what next? hire a man to draft them or dig them up and commence over again.

But I am digressing. Is your ground new ground, covered with brush and more or less timber? So much the better. After your little nursery is planted,

how you will watch their growth, and how much more you will think of those trees than if bought from the perambulating tree peddler, with all his jingoism and big pictures.

After your brush and timber are in full leaf, lay off your ground, burn all brush and rubbish on the stakes, so far as possible, where trees are to stand. Now after chopping and burning, if not too hard pressed with other work, I would advise the plowing of the ground at once, but ground can lay until fall and winter to be plowed and cleared, and ready for the trees to be taken from the nursery and transferred to the orchard. If care is used in taking up from the nursery, they will hardly know that they have been moved, and will go right ahead; and then, if you grow your own trees, you will receive much pleasure in seeing the growth of the trees you have been associated with from the opening of their first bud. But your work does not stop here; you must watch your trees as a parent watches the development of a child. If your trees start to go astray you must correct them, for an error allowed in first growth of a tree is hard to overcome in after years. And my own idea of this whole matter of the growing has undergone a great change since coming here from my native state.

Your orchard is now planted. You have been told to watch the growth and development of your trees. Do you want a 2-foot head, 30-inch head, 3-foot head, or 4-foot head? Your trees are ready to do just as you guide and instruct them.

Future Care.—If your ground is such that it can be cultivated, plant it to some hoed crop two or three years, but to oats or wheat, never. After, say three years, seed it to clover, and seed it heavy, and after getting well set to clover, watch your trees to see that no timothy, red-top or blue-grass forms a sod around the roots. I am forced to this conclusion by examining an orchard five years planted on a high elevation among grubs and stumps; planted three years to corn, but got nothing; ground too poor; after three years trying to get corn, it was seeded to clover; they got clover, and now five years planted they got fruit; and a plate or two of it is here for inspection. A little more and I will close. After your ground is in clover, what will you do with the clover? will you mow it and take it off for hay? This is all right, but what is better, protect the bodies of your trees and turn in hogs or sheep; that is Western New York way of growing clover in orchards.

Mr. President, I do not want you to think I am too savage on the tree-peddlers; not a bit of it; but I am not in love with them, and let me tell you why: In Wayne county, New York, I had for a neighbor the Hon. T. G. Yeoman, nurseryman and fruit-grower, a man whose word was as good as gold, but he had no tree-peddlers on the road. This was an honorable gentleman, and when you bought trees of him you could plant with safety, and if you lived to see them bear you would find them true to name. Coming to Missouri, and from such a nursery, I thought I would find the same here, but I was doomed to disappointment. Of my first 500 trees, 300 Ben Davis, 100 Lawver, 100 Huntsman, I have not 25 trees of any one kind, unless it may be Huntsman.

My next 500 were, 200 Lawver, 100 Walbridge, 100 Wolf River, 100 Mann. I guess these are all good kinds and varieties, at least the pictures looked pretty, but let me tell you that nearly all of these named apples bore a little last season, and I can assure you I have got the finest lot of elder apples growing you ever saw. I say elder apples for the reason they are not large enough to peel to evaporate. Now, all of this waiting, wrapping, watching, washing and loss of time to be gone over again. Either dig up and replant, or graft, of which I have concluded to accept the latter plan, and graft at least 800 of the 1,000 trees.

In closing, allow me to say if you buy trees at all buy from your nearest home nursery. If not from them, deal direct with the proprietors, asking them to give

you the discounts, instead of the peddlers. I do not wish to be understood that the tree-growers of Missouri are not up to the standard in business integrity with any other class of men, for I know many of them, and I know them to be first-class men in all particulars. The men I refer to are a different class of men entirely, as I have found, and in no less than three different cases, and five to eight years' loss of time, and \$269 on one bill, \$75 on another, and near \$100 on another. But for all this I still live, and have plenty of trees growing that I believe will prove true to name, 1,500 of which I bought from our mutual friend, N. F. Murray. It is a delicate question to bring out so publicly, but still it is due to those who, like myself, when first coming here, are unacquainted with the ways that are used in the tree business; and I could not do justice to myself or the subject given me unless I touched on this point. And to show you that I try to practice what I preach, I am getting ready to plant forty to fifty acres more next spring, and my trees are now standing in my little nursery, and I shall have no trouble in selling to my neighbors those I do not want to plant, and at prices that leave me my own trees very cheap.

Since preparing this paper, a friend of mine sent me a plate of apples he says he bought for Wolf River. (I have them with me.) The trees I planted for Wolf grow apples about the size of a small Winesap on old trees, and look in color something like Jennetings. My Lawvers are not Lawvers at all.

HOW TO GROW AN ORCHARD IN NORTH MISSOURI.

I notice in the program that this paper is to be followed by one from Mr. Nelson, telling "How to Grow an Orchard in South Missouri," and whatever may be the outcome of these papers, I think this plan a step in the right direction.

My study of the standard works on growing orchards, together with my own experience and observation in several States east and west, has led to the conclusion that a large part of the failure and very unsatisfactory results in growing apple orchards is due to the erroneous belief that the same rule and treatment of the apple tree will apply in all sections of the country, and, most unfortunate for the Western people, we received our information from Eastern authors and followed their instructions till failure and disappointment began to meet us on every hand; then the inquiry, "What is wrong with our orchards? Are we to infer that our authorities were all wrong—untruthful or ignorant of their subject?" By no means; they were noble men, who did their work well, and knew whereof they wrote. All honor to their memory! Why, then, have we so often failed, when following their instructions? Simply because of difference in soil and climate. What was wholesome food for the apple orchards of New England and the Middle States, became poison and death to the apple orchards on the fertile lands of the West, exposed to the sweeping arid winds and scorching sunshine from a clear sky.

To illustrate: Mr. Barry instructs to train the young apple tree in vase form with open head, in order to let the air and sunshine into the tree to ripen the fruit. Now we can testify from our own experience that Mr. Barry was right at home, and his practice would apply all right in the Ohio valley, because of the wet, cloudy, foggy climate.

I well remember, when a boy, of helping my father scrape the moss off the trunk limbs way up into the tops of a thrifty orchard eighteen years old, and trimming out the heads to admit sunshine to ripen the fruit, much of which had been colorless, clouded and inspid. But who has ever seen moss growing on the limbs of apple trees growing in the West? It will hardly grow on rotten logs or on rocks in North Missouri. The vase and open-headed plan has been tried here, to the ruin and destruction of tens of thousands of trees.

Now we need not wonder at this when we consider the distance apart and difference in these two sections of country. Progressive horticulture will yet find that not only North and South Missouri must learn how best to grow an apple orchard, but each county may find the particular treatment that will give greater and more satisfactory results than yet obtained.

In attempting to tell how to grow an apple orchard in North Missouri, we shall assume to do so from a financial standpoint, believing that the varieties, planting, care and treatment that will give the largest and quickest returns on capital and labor invested will be accepted as the correct one, and prove more satisfactory than fancy, untried and impracticable theories. First:

SELECTION OF GROUND.

In doing so don't be so mean, stingy and inconsistent as to select the poorest worn-out field on the farm for the orchard and expect it to bring ten times as much money as the richest field will in other crops, and then condemn apple-growing for profit if it fails to do so. Remember that your apple trees love a good, rich, mellow soil, and will express their thanks for the same by their rich green foliage and beautiful luxuriant growth. As to the degree of richness of soil for an apple orchard in North Missouri, we will say that land rich enough to produce a good average crop of corn is all right for the apple orchard. As to the lay of land, we of North Missouri need not worry about that, for we can grow abundant crops of apples from the water's edge over our five to ten miles wide river bottom up over our steepest bluff range, and way out over the broad rolling prairie; in each of these three sections the apple orchard has its warm friends.

We know of one orchard in the Missouri river bottom that nets in one year \$350 per acre, another on the hills that nets \$400 per acre, and it is a question among grovers in North Missouri, which of these three sections will pay the best in the run of years.

DRAINAGE,

To which so much importance is attached by writers, and so very essential to successful apple-growing in most all states and in much of our own State, is not necessary in a great portion of North Missouri. Our river bottom lands are under-drained by strata of sand, while our bluffs and rolling prairies are underlaid with a free, open, porous subsoil and marl beds (peculiar to and only found in the Loess formation), which obviates the necessity of any and all artificial drainage.

Then we may at our own pleasure select any part of our farm that will grow a good crop of corn (or the poorer land, if desirable, by manuring it), then prepare the same in the fall of the year by plowing it deep, not less than one foot, then set a few stakes in range for first row as in marking corn land, taking a steady team, and plow and run a straight furrow, setting your stakes over for the next row, and continue till you have done the plat; then cross-mark it with a good, deep furrow. Land prepared in this way will require but little further preparation, and have left it almost ready for setting the trees, and the good effect of winter's rain, snow and frost on land thus prepared will be noticeable in the thrifty growth of the trees for years. However, if the lay of the land is such that there would be danger of damage by washing rains in following this plan, then stake off the orchard plat and dig good large holes, at least two feet wide and eighteen inches deep, and leave them open all winter.

DISTANCE FOR PLANTING.

On this part of our subject we find a wide difference of opinion, arising no doubt from a varied experience in growing varieties of a natural dwarf habit, and the larger growing varieties, on bottom, bluff and prairie, rich and poor land, good and bad treatment; all these points must be taken into consideration, from the fact that nearly all varieties now grown in North Missouri for commercial orchards, such as Ben Davis, Jonathan, Winesap, Missouri Pippin, etc., are medium in habit of growth.

We would advise to plant on bottom and rich prairie land, thirty feet apart each way; on bluff and hill land twenty-five feet apart; and if properly managed and made to fruit, and not left to run to wood too much, they will never crowd to hurt.

SELECTION OF TREES TO PLANT.

Our own preference of trees is two-year-old trees, with low heads (three feet from the ground), and we don't care so much how they were propagated, whether on piece roots, whole roots, or budded, just so they are good, sound, thrifty, well-rooted trees, free from insects and properly handled. The orchards already referred to in this article that net from two to four hundred dollars per acre in one year were grown on so-called piece roots. We have for years tried all these methods, and our preference is for piece-root trees; in fact the whole-root system may sound ever so nice in theory, but it is impracticable in the commercial nursery. This much on growing nursery trees (although a digression from our subject), we trust, is pardonable, for we must not forget that good, sound, well-grown nursery trees, true to name, are essential to successful apple growing.

If the young trees have been properly cared for in the nursery and carefully taken up, they will need no pruning before planting, either root or top, except to cut smooth any broken limb.

TIME TO PLANT.

Time for planting, early in the spring, as soon as the ground is in good working condition. Don't plant in mud, or when the soil is too wet to handle for grain. Plant the trees but slightly deeper than they grew in the nursery. Incline them slightly to the southwest. Round the dirt up a little in bottom of hole before placing tree in, so as to let the roots incline down a little in their natural position; fill up the hole with fine mellow earth, taking care to fill all interstices among the roots, and press the earth firmly about the tree with your feet. Some advise puddling the roots (dipping them in prepared mud) before planting, and we think it quite a good plan; we have practiced it with good results; trees are more sure to live. But there is one thing still more important: never let the roots of your trees get dry. When you go to the nursery or place of delivery for your trees, take wet straw, hay or canvas to protect the roots from sun and wind; as soon as you get home, wet them good and heel them in the orchard ground and take out as you plant.

When your trees are planted, don't cut the top back; it will multiply branches and make top too thick. And don't try to make a vase, fan, pyramid, flag-pole or any unnatural thing out of your trees. Use common sense. Observe the laws of nature, and let them grow and make what nature and nature's God destined them to be—trees: beautiful, low, round-headed, stout-bodied, thrifty, healthful, fruitful trees. Cultivate the orchard in root crops or dwarf corn; cultivate often and

thorough; hoe around the trees; trim just a little each year in early spring and summer, but beware of trimming too much. Remember the general rule in common practice is to cut, saw, slash, mangle and murder the apple orchard. The apology of some for this barbarous treatment is to get the limbs out of the way of cropping the orchard. Our advice to all such is, if their land will pay them better in farm crops than in apples, then by all means cut it down. Why should it be left in the way? But if the apples pay best, give the orchard a chance, and after five years' planting the orchard, never once think of growing anything in it except red clover or something that will benefit the trees. Continue the cultivation each and every year. Don't plow too deep, two inches is enough; harrow often with a fine, sharp, steel-tooth harrow to pulverize the soil; when kept in this condition, it is the best mulch in the world, and the result is wonderful. Be careful not to bark or injure the trees with plow, harrow or other implements. Protect from gophers by trapping or giving them poison placed in small bits of apples or potatoes, and dropped in their holes. Protect from rabbits by putting screen wire around the trees, or any kind of paper, straw, grass, weeds or other material. Protect from borers by using alkali washes on the body once in May and once in June; or by cutting them out when they get in. Live in your orchard. Look at your trees often; watch, love and nurse your trees, and then see if they don't in return smile on you and even blush when you look at them, and bow down to you, and even say, "Come and relieve me of this burden of fruit; it is all yours for the kind treatment you gave us."

We have some good orchard lands in North Missouri, along our river hills, so steep that it would not be advisable to cultivate the entire surface on account of land washing badly. On such lands we advise, while the trees are young, to sow the land in red clover, except a strip six feet wide along the tree row; cultivate this strip nicely, and hoe the trees. Either mow the clover for hay, or let it rot on the ground; in either case it will be a great benefit to the land and orchard in later years. After three or four years of this treatment, reverse; sow cultivated strip along tree row and under your trees in clover, and plow up the clover in the middle, and cultivate a strip in the center ten or twelve feet wide; by this time the feeding rootlets of the tree will have extended out so far from the trunk that the cultivation in the center will do more good than nearer the trees. Where land is poor, fertilize by using wood ashes or barn-yard manure, spread evenly over the ground and worked in. Mulching with straw, hay, weeds, coarse manure, leaves, branches of trees cut when leaves are on, have been recommended and practiced by some. We doubt the advisability of this treatment. It makes a grand harbor about the tree for mice, moth, and all manner of insects, and in a dry time exposes trees to loss by accidental fire. The mulch, while on, holds moisture near the surface, induces roots to feed near the surface, and if the mulch is for any cause removed, the tree will receive a great check and damage. In exceptional cases, and with care, it may be used to advantage around trees where soil has washed away and roots are exposed.

FERTILIZATION.

Our experience and observations in the orchard for years have led us to the conclusion that all varieties of the apple are benefited more or less by cross-fertilization, and for this reason should be planted in close proximity to each other.

We notice in the Ohio State Horticultural report for 1888-89, page 179, that Henry Ray planted in 1865 six acres, about two-thirds Ben Davis on the north, the balance on the south, consisting of Winesaps, Janets, etc. It produced several fine crops. In 1871 he set several acres adjoining on the east side, solid Ben Davis;

that orchard has never borne a satisfactory crop, and is now on the decline. Allen Cope in 1863 set 500 Ben Davis; forty of little Romanite had died and a few others. A survey of the land showed room enough for a row on the south end. After planting that row and filling in where the others had died, he set the balance, eight rows, on the west side. Our experience has been that the end row and those used to fill in bore more and finer fruit than the average in the solid block. We have ten acres set entire with Ben Davis, eleven years old. It never has borne a full crop of perfect apples.

We deem this a matter of too much importance to give it a mere passing notice. Heretofore almost every orchard in the country, small and large, has been made up with a large variety, but now we have reached a new departure. The large profit from apple orchards in recent years has induced planters to engage in the business more extensively, and they now plant from ten to one hundred acres with a very few varieties. In some instances a large block will be planted with Ben Davis. We doubt the wisdom of planting these solid blocks with any one given variety, and would advise and urge planters not to do so, but instead plant at least a few good standard varieties. Plant varieties alternately, so that no variety will be more than two or three rows deep. Our selection of varieties for a commercial orchard are Ben Davis, Jonathan, Winesap, Missouri Pippin, York Imperial, Babbitt and Willow Twig, and very largely of the two first named. Ben Davis is rapidly growing in favor as a shipping apple for export, and the Jonathan is destined to be the apple to supply the fancy retail trade in all our large cities. It is ready to eat in October, and by holding in cold storage can be kept in fine condition until June, thus covering the entire season for winter apples. The tree is very hardy, bears early and abundantly. It will be observed that we leave out summer and fall varieties in our list for a commercial orchard. They should be grown in the orchards of those who make fruit-growing a specialty. The farmer should never be compelled to leave his grain crop and harvest to market summer fruit.

VARIETIES FOR FAMILY USE.

In this every one can afford to select such as they like best--and tastes differ very much. We will, however, name a selection of varieties and number of each for an orchard of fifty trees, that will give a succession of good apples throughout the apple season: Two White June, two Early Harvest, two Red Astrachan, two Duchess, three Maiden Blush, three Rambo, two Talman Sweet, two Broadwell Sweet, eight Grimes' Pippin, eight Jonathan, eight Ben Davis, eight Winesap.

OVER-GROWTH.

There is but little if any danger of too much growth during the first four or five years; at this age the trees should bear from one peck to one bushel per tree. But it will occur sometimes on our rich lands, with good culture, that the trees will make such a tremendous growth that they fail to form fruit-buds; to prevent this, sow the orchard in oats once; this will check the growth and cause fruitfulness, after which continue the cultivation, and aim to get six to twelve inches of growth each summer. One other cause of unfruitfulness in young trees is that some, through ignorance, prune out all the fruit-bearing spurs on their young trees in order to get an open head or higher top, forgetting or not knowing that young trees ought and will, if treated right, bear their first crop in the heart of the top on fruit spurs and small limbs. These should be left till they have performed this function, and cut out as the tree grows older and larger. There is but little danger of the top growing too thick in North Missouri, if left to take a natural course.

All forks should be prevented, and limbs that cross or get broken ought to be cut out. They may be permitted to grow twice as thick as in the Eastern States without any injury to the fruit.

ADVANTAGES OF LOW-HEADED TREES.

They can be grown and fruited from one to three years quicker, will stand more erect, cannot be swayed and broken so much with storm and sleet, will not sun-scauld and bark-burst on the body, will last longer, fruit will not damage so much when it drops, and the crop can be picked at one-half the cost. One thing more: if you want to know how to grow an apple orchard in North Missouri, or anywhere else, and make a success of the business, join our Horticultural society, take an active part in their discussions, get our reports and study them, get all the information you can, and then reduce it to practice, and my word for it you will succeed.

N. F. MURRAY, Oregon, Mo.

THE MISSION OF FLOWERS.

True greatness lies in a hearty appreciation of small things, and real littleness may be shown in a disposition to despise some of the minor creations of the Deity. Henry Ward Beecher exhibited rare wisdom in refusing to answer a carping critic, who considered that a lad of twelve years might be engaged in a more useful occupation than floriculture; but when he said later in life, "I wanted to tell him that since God Almighty had taken time to make such trifles, I couldn't see why it was wrong for me to cultivate, look at and enjoy them," his answer rebuked many such unreasoning fault-finders. Mr. Beecher fully comprehended the mission of flowers, and when he was once asked by an unsympathetic soul, "What good do they do?" he earnestly answered, "Why, they will make you happier and better, every time you look at them."

In Mrs. Beecher's recently published reminiscences of her distinguished husband's life, she says: "He was seldom seen without a rose or other rare flower in his hand;" which sentence tells more for the beauty of his character than a whole page of ordinary eulogy could have done. One gentle poet, with wonderful appreciation, has said of flowers:

Ye are prophets sent to the heedless world,
The skeptic heart to teach;
And 'tis well to read your love aright,
And mark the creed ye preach;
I never *could* pass ye heedless by,
For mine is the *old* belief:
That 'midst your sweets, and 'midst your bloom,
There's a soul in every leaf.

All blossoms are prophets; they come to us early, while yet the snow lies on the ground, and in the sweetness of the trailing arbutus, they whisper of the sureness of spring. Very early, too, does the crocus lift her bright head to gladden our hearts with her smiles, and the snow-drop, the hyacinth and the anemone come forth only a little later with their messages of peace and good-will to the world.

Nor are these lovely missionaries confined only to one part of the globe; the whole earth has its complement of bloom and fragrance—except, perhaps, those torrid surfaces which suggest the idea that Pluto's domain is encroaching on this sphere of ours.

The snow-capped summit of the Rocky mountains bears a variety of beautiful blossoms, while among the most dangerous peaks of the Alpine heights there grows a flower which is so exquisite that it tempts the ardent swain to risk his life, that he may place it in the fair hand of his lady-love.

Yea, verily, their gentle ministrations are not alone to the pampered darlings of society, not alone to the rich or the great, but to every created being; they lift their bright faces and appeal to all within the souls of humankind that is best and most holy.

We find them in woodland and meadow, cultivated in gardens, and growing profusely along every hedge-row, dotting the broad prairies with their richest luxuriance and hiding modestly beneath the under-brush in the forest. Surely the Creator of the universe must love flowers; and as nothing has been created in vain, is it not well to pause and inquire what may be the mission of these exquisite things?

I once read in some old legend, or else dreamed the story a long while ago, that flowers embody the souls of frivolous women, who lived when in the flesh only selfish, luxurious lives, doing no good; and so the Master kindly gave them one more opportunity, and allowed them to return to this world in the form of some flower, and thus to help gladden and brighten human hearts, and that when one of these unobtrusive missionaries was carried to some sufferer in a hospital, or to any sick room, when the flower faded and died the woman's soul imprisoned in its heart went straight to the gardens of Paradise, there to dwell in happiness forever.

No mortal can ever discover the boundaries of the many missions filled only by the silent influences emanating from the floral kingdom. Notwithstanding the glorious light their divine Creator has shed around them, they are among the mysteries, and the good they do is known only to Him who sent them out to brighten and beautify the earth. In all ages, and in all climes, have these messengers of Eden been found appealing to the better part of human nature, and ever since Adam and Eve were placed in the gardens of Paradise, human beings have loved and cultivated flowers. There is not one heart where dwells any moiety of sweetness which does not contain a spark of appreciation for Flora's domain.

The plainest exterior frequently covers a heart full of truth and fine sentiment, and behind a mask of coarsest texture a gentle soul may hold daily communion with God, because it understands and reads aright the love displayed in the floral creation.

It does not require a costly orchid, a prize chrysanthemum, nor other variety of choice and rare plant life, to make glad the human heart. A genuine joy may be evolved from the cultivation of flowers comparatively costless, and even the wild wood and prairie blossoms may be grown and improved with real satisfaction.

In a painfully plain and cheap country-house, I once made my home for a few months; it was a place where everything connected with it denoted poverty, and lack of judgment in labor expended; but in that otherwise unsightly place there was a flower garden, in which grass-pinks, common roses, old-fashioned lilies, hollyhocks and peonies were cultivated; and though they were growing side by side with the vegetables usually found in country gardens, they spoke eloquently in praise of the poor over-worked woman who gave them such tender care, and who from her poverty gave them also the space which she could have utilized in growing something either to eat, or to carry to the green grocer for sale. She gave to them, in addition to the last named sacrifice, time which to her was money, and strength of which she had little to spare from the coarser toil which her daily needs compelled her to perform.

This woman's daughter despised flowers, and declared, "I've no use for them," and in thus declaring she showed the lack of womanly attributes which caused her to seem totally devoid of gentleness, and that sweetness which endeared her mother to so many good people.

In that home a noble self-sacrifice shone softly from the mother's withered, care-marked features, and side by side grew the flowers of love and duty in her tender heart, even as grew in her little garden the roses beside the cabbage rows. Many a night, after a day of hard labor, did this poor old mother carry water until midnight to drench the sandy soil, so that her flowers might not all perish of the drouth.

Many may doubt the poetic idea of a soul in every blossom, but no one can question, in view of such a fact, that flowers wield a refining influence, and that they fill a grand and definite place in the economy of nature, and that their mission is manifold, far-reaching and helpful to a degree not fully comprehended by the busy denizens of this nineteenth century world. In many a desolate heart the love of flowers seems to be the only visible cord binding it to its Creator.

Those who have been blest with time, strength, and the ability to grow flowers, should help them to perform their most sacred mission. No accessible sick-room should be left unvisited by these sweet missionaries, nor should the wistful eyes of childhood be permitted to gaze on these treasures and go away with a natural longing to possess a few unsatisfied. We can never fully realize how the gift of a few flowers to some homesick, sorrowful soul in a hospital has inspired in the lonely heart a sincere happiness, and because some one has cared to give him a flower he has decided to show his gratitude by getting well as soon as possible. Thus may a flower be a missionary of hope leading to health.

Tennyson has told a beautiful truth in his touching hospital story, in which he says :

They that can wander at will,
Where the works of the Lord are revealed,
Little guess what joy may be got
From a cowslip out of the field.
Flowers, to these spirits in prison,
Are all they can know of the spring;
They freshen and sweeten the wards,
Like the waft of an angel's wing.

Mid the daily cares of life, we often omit opportunities of aiding the flowers to fulfill their best mission, but when we fully realize the good that we might help them to do, we are sorrowful because we have hindered rather than helped them.

Flowers are more for the living than for the dead, and though we fill every dead hand in the world with choicest blossoms, they can not cause the cold pulseless heart in the silent breast to give one throb of emotion; but the living heart will thrill with gladness, when we place in living hands these emblems of thoughtfulness and love.

Much of our most beautiful poetry has been inspired by a love of flowers. Such grand minstrels as Bryant, Longfellow and Tennyson have not considered this theme beneath their genius, and have dedicated some of their most beautiful stanzas to the goddess Flora.

Little children always love flowers, and any toddler will risk a tumble from the sidewalk to gather even a dog-fennel bloom.

Children, birds and flowers are three inseparable graces, three delightful missionaries to a sorrowful, sin-sick world.

Three angels, standing on the sad shores of time, singing of the joys of eternity.

As a fit closing to this paper, I will read a portion of Longfellow's poem on flowers :

Spake full well, in language quaint and olden,
One who dwelleth by the castled Rhine,
When he called the flowers, so blue and golden,
Stars that in earth's firmament do shine.

Wondrous truths! and manifold as wondrous,
God has written in those stars above;
But not less, in the bright flowerets under us,
Stands the revelation of His love.

Bright and glorious is that revelation,
Written all over this great world of ours,
Making evident our own creation,
In these stars of earth, these golden flowers.

Everywhere about us they are glowing,
Some, like stars, to tell us spring is born;
Others, their blue eyes overflowing,
Stand like Ruth amid the golden corn.

In all places, then, and in all seasons,
Flowers expand their light and soul-like wings,
Teaching us, by most persuasive reasons,
How akin they are to human things.

And with child-like, credulous affection,
We behold their tender buds expand,
Emblems of our own great resurrection,
Emblems of the bright and better land.

Mrs. GEO. E. DUGAN, Sedalia, Mo.

SOME SUMMER LESSONS.

The subject assigned me might well, I think, have engaged the attention and ability of some of our able writers, and members of more experience; but we do not mean to find any fault, and will attempt to mention some of our "Summer Lessons."

Summer: that word is suggestive and full of meaning to the horticulturist:

O, time of verdant beauty,
Of strawberries and leaves,
Of sentiment and roses,
Of balmy moonlight eves—

Carrying with it the idea of beauties, pleasures, delights and charms, which the horticulturist of all men ought to be able to appreciate and enjoy, as his work lies so near the great throbbing heart of nature itself. And yet, at the same time, he is reminded of the days and weeks of toil, labor and anxiety; from morn till night, always busy; one thing pressing hard upon another; almost overwhelmed in his efforts to keep up with the advancing season, the growing crops and the ripening fruits. Every moment is filled to its utmost. It is work, work, work. Such is the horticulturist's summer. And here we are reminded of the truth of the poet's words, when he says:

Continual good is sure to cloy;
'Tis from the mixture of alloy
That ease is ease, that joy is joy.

And after the past season of activity, bringing with it disappointment or success, what have we learned? Have we been able to draw legitimate conclusions from the multitude of facts as they have presented themselves to us, and to make correlations that shall be of use to us in the future? No doubt we all have learned some lessons, for the world is a great school, and we will learn whether we would or not, and now feel confident that our successes will be more numerous and our disappointments proportionately fewer in the years which are to come.

Knowing that I spent the summer with the special object in view of learning practical horticultural lessons, it was probably our Secretary's intention that I should give you some of the facts which impressed themselves upon me, from my own personal observations and experience. And let me say that I would not excite your expectations unduly, for the lessons of the past summer, though new to me, may be only a repetition of your own experience.

Among other things, we have lately been impressed with the boundless extent of the field of horticulture. What a domain for study and investigation! What practical applications to be made of the sciences of botany, chemistry, geology and entomology! What a vast amount of experimental work before we shall be able to understand perfectly the physical nature of all the plants and trees with which we have to deal—their wants, and how they can best be supplied—their enemies and diseases, and the remedies for the same—their utility, productiveness, profitability, and a thousand other things which the competent horticulturist should understand if he would be successful!

The question arises, though we spend years in experimental work and study, will we ever make more than a beginning?

One incident, which comes forcibly to my mind when I reflect on the lessons learned the past summer, was one in which the rabbits figured conspicuously. It was in our young apple orchard which was planted last spring. We knew that the rabbits were very numerous in that neighborhood, as it was newly-cleared brush and timber land, but thought they would not be troublesome before winter. But right here we were mistaken, for in the latter part of August and in September they gnawed about 200 of our young trees, showing us that they considered apple bark quite as good for a summer as for a winter diet. We lost little time, after finding the extent of their damage, in getting protectors and putting them on. We used the veneer protectors, made of poplar nine by eighteen inches, and one-twelfth inch thick, costing only \$3 per 1,000 at the factory. Now we feel quite safe against the depredations of rabbits, and borers, too.

We have heard some serious objections to this kind of protectors, but their cheapness and their effectiveness, and the ease and rapidity with which they can be put on or taken off, leads us to believe that they are the most economic article of the kind to be obtained.

The peach-growers of Missouri, we believe, have little reason to complain this year. If the results have not been satisfactory, "Accuse not nature, she hath done her part; do thou but thine." It was our good fortune to see, handle and taste some of those large, beautiful and luscious peaches for which Missouri is becoming famous. Surely finer ones never grew anywhere, not even in famous California. Why, would you believe it, Missouri is now even sending them to that State, and they are the wonder and surprise of all who see and taste them. It is hard for them, and probably for some of us, to realize the fact; but "facts are stubborn things."

There are many things, however, to be taken into account in making peach-growing successful, not the least among which are the proper selection of varieties, pruning, and proper handling of the fruit.

In the matter of selecting varieties we think the saddest mistakes are made—not in peach-growing alone, but among all classes of fruit. What can be more painful and disheartening to the husbandman than, after years of careful attention, planting, pruning, fertilizing, cultivating and protecting, that a tree or plant, though it should look thrifty and vigorous and give promise of abundant fruitage, which is often the case with some of our worthless varieties, should fail to produce the anticipated harvest; or, if any, but worthless fruit. Yet we have seen scores of just such instances, and many are making the same mistake to-day. When we find a variety that is unprofitable or worthless, let us relegate it to oblivion forever; or, to use the words of the great teacher of men—"Cut it down; why cumbereth it the ground?"

If this had been done years ago with some of the varieties of peaches which we have to-day, notably among them the Hale family, many disappointments would have been saved the Missouri fruit-growers. Let there be more such sorts as Family Favorite, Elberta, Gold Dust and Wilkins planted, and there will never be cause for regret. While such varieties as Chinese Cling, Susquehanna, Foster and a number of others, may do well once in a while, still they cannot be relied on for good paying crops.

Pruning is one of the main points about peach-growing, and consists chiefly in cutting back each year's growth about one-half. By this system of annual pruning the trees grow stocky and spreading in form, making the tree self-sustaining and capable of bearing four to five bushels of fruit without the aid of props. It also facilitates the thinning and picking. We have seen trees bearing four bushels of fruit picked without the aid of a ladder. It is a belief of mine that a peach tree under such pruning will produce larger, smoother and better fruit than one pruned in the usual way. It will throw out fruit-bearing twigs all along the main limbs, and even on the trunk down to the ground. They seem to die off in a year or two, only to be replaced by others, so we have a renewal system producing an abundance of new wood each year, and bringing the fruit down where it is easy of access.

Thinning is an indispensable operation where large merchantable peaches are wanted, and it is not such tedious work as some imagine, but it requires no small amount of grit and determination to attack a tree well laden with green fruit, smooth and healthy, only wanting a few weeks of warm sunshine and a few gentle showers to turn it to blushing lusciousness. I say—for I've been there—it takes a good deal of determination, almost akin to recklessness, to pick off and destroy two-thirds of that fruit; but we must not let our sentimentalism get the better of our judgment. Fruit-growing is a business, and if we expect to make it a success, we must run it on business principles.

If this practice or method pays, then let's keep it up, for pay is what we are after. In the case of the peach the results are striking. Thinning pays. I believe there are many cases where it would be equally profitable if practiced on the apple, though I have never seen it tried. The principle involved in thinning fruit is simply this: nature's efforts always tend to the production of seed and the preservation of the species. Our object as fruit-growers is the production of fruit or pulp; and the fewer the seeds the better. So we make an effort to thwart nature's plan, and in thinning we are partially successful; for we thereby reduce the number of seeds before they have absorbed much of the vitality of the tree. Our

scientists tell us that seed production is the most exhaustive function which the tree or plant performs; so we can see at once the advantage which will accrue to the remaining fruit. If the thinning be done judiciously and with intelligence, we reduce the production of seed without materially affecting the yield of fruit. We are glad to note that it is the opinion of our experimenters in the production of new fruits that there seems to be a certain relation existing between the crispness, juiciness and fine quality of our improved fruit and the quantity and size of the seeds; and that as a rule, our finest and best varieties, in all classes of fruit, are the ones containing the least amount of seed. So we seem to be approaching our great desideratum—seedless fruit.

Before we shall be able to tell exactly the proportion of fruit to remove when thinning, taking into consideration the class of fruit, the variety—for all varieties have different characteristics—the age and thrift of the tree, and the probabilities of the season, insects and fungus diseases, we shall have many “Summer lessons” yet to learn.

In the packing of fruits, we have learned that carefulness should be the watch-word, and that honesty should not be forgotten. However fine the fruit may be, it will not be appreciated in the market unless properly packed. All our careful planting, pruning and cultivating counts for naught, unless the fruit be carefully sorted and placed in standard packages which are new and neat. To see fine large fruit bruised and ruined for shipping by being run through sorting machines or other such devices, which are used now by some packers, rasps and grates the whole being of the real horticulturist and true lover of fruits. Yet we have seen such things done, though much to our sorrow, and, too, when there was nothing gained, not even in time; for the same number of men, if set to sorting and packing by hand, would put up just as much fruit and do it like it should be done. The question is, how long will it be before we will reach perfection in packing our products for market?

I will now mention more briefly a few more of my “Summer Lessons.” That new timber land is better adapted for orcharding than old or prairie land.

That we should grow more plums. In our own market, a town of 4,000 inhabitants, they are scarcely ever seen.

That the Keiffer pear is not blight-proof.

That you cannot start a good raspberry patch, especially of the Gregg variety, on very open loose soil. The roots seem to require a close firm foundation for the first two years to get well started. I never saw ground too rich for raspberries; it seems to be the looseness which affects them adversely.

That the Warfield strawberry is very much subject to rust, at least in some localities of our State.

That the Jessie strawberry is not doing what was expected of it in Clinton county, and that the Crescent is the old stand-by, while Bubach is hard to beat.

That Worden and Moore's Early are the grapes for us to plant in North Missouri. That there is still some money in pears, though the deadly blight is still on deck.

That the Marianna plum is no good for fruit.

E. L. POLLARD, Cameron, Mo.

REPORT ON ENTOMOLOGY.

Mr. President, Gentlemen and Ladies:

On the program, I am announced to have an essay on “Insect Architecture,” and it was at first my intention to attempt to introduce to you the constructive

ingenuity and adaptive skill of insects in preparing habitations for their young, and in securing protection and concealment for themselves. But upon consideration I was convinced that those who would be so kind as to listen to me this evening would be far more interested in a practical than in an abstract subject; I therefore beg to present a few thoughts on insects in their relation to human interests, and to an outline of the progress of applied entomology during recent years.

The insect factor is one which must be taken into account in every department of agriculture.

The grain-grower of the present day sows his seed in greater uncertainty than ever before whether he shall reap a bounteous harvest, or whether he shall see with despair the gradual blighting of the fair fields upon which so much of his future comfort and his ability to meet his unavoidable obligations depend. He realizes in the light of much sad experience that the Hessian fly, the chinch-bug, the Grain Aphis and the joint-worm, creatures so insignificant, individually, that his eye can scarcely take cognizance of them, are, as representatives of their species, the synonym for the season's success or failure.

The orchardist, too, digs and plants and prunes and enriches. His trees wave their blossom-laden branches in the vernal sunshine, and in his mind's eye he beholds the luscious fruitage that shall not only load his own and many other tables with "good things," but shall also fill his pockets with "double eagles" and crisp "greenbacks," to be in their turn converted into the luxuries of books, pictures and travel. But into these happy visions presently intrude unwelcome, but only too well-founded, fears of borers, canker-worms, codling-moth, curculio, and all the winged and wingless host of devastators at whose mercy he holds the realization of his happy anticipations.

In the vegetable garden, with the tender leaves appear also cut-worms of kinds almost innumerable, flea-beetles and aphids in myriads, great sphinx larvæ and voracious beetles, which dispute the tiller's right to cabbages and cucumbers, to tomatoes and potatoes, the long rows of which he has planted and transplanted and watered and hoed with persevering toil.

In the flower garden, almost more than elsewhere, is "eternal vigilance" the price of beauty. What with slugs and bud-worms and stalk-borers and plant-lice, the floriculturist is sometimes tempted to feel that esthetic gratification in that direction is obtained at too great cost, and that he or she had better give up the struggle and seek other sources of enjoyment. I say "tempted" to do so; but where is the true lover of flowers who ever did so retire from the field? No, indeed, flowers are too irresistible petitioners in their own behalf to be thus turned over to the enemy. And that industry, ingenuity and patience are always measurably victorious in the warfare, witness the almost infinite and exquisite illustrations of the care and skill of professional florists, and the bewildering beauty of amateur rose gardens and chrysanthemum houses.

That the insect problem is more momentous and complicated in America than in any other quarter of the globe is not to be disputed and is not difficult to account for. The vast extent of our country, with its diverse climates, soils and altitudes, the consequent variety of indigenous vegetation and accompanying insect life, for as Lowell with a poet's unerring inspiration tells us,

There's never a leaf nor blade too mean
To be some happy creature's palace—

The numerous transcontinental and meridional railways, affording insects unticketed transport from one state and section to another—the general lack of know-

ledge of their habits, which suffers them to get an ineradicable foothold before they are recognized as pernicious—all these give to every locality a majority of the pests of every other.

In accounting for their numbers and rapid spread, we must take into consideration the superabundant food supply and the protection afforded them by grain fields, orchards and gardens, and the other accompaniments of civilized life. The species that originally burrowed in a thorn apple or wild plum, or tapped the stalks of certain wild grasses, or gnawed the spiny leaves of a western *Solanum*, discovered a paradise of plenty when they had once found their way to cultivated grains, fruits and vegetables. Here man was for many years unable to cope with them, and their natural enemies were slow to follow them, and there was nothing to stay their ravages. Some of us can remember how rapidly the potato plants disappeared before the voracity of the Colorado beetle on its advent into the vegetable gardens east of the Mississippi; how the yield of plums and sweet cherries was cut off as the curculio transferred its taste from the wild to the cultivated sorts, and how all the more delicate varieties of grapes succumbed to *Phylloxera*; and these but represent hosts of other species and similar devastation on other plants.

But it is not with native insects only that we have to contend. Undesirable immigrants from Europe, Asia and Australia are not all of the bipedal races. Scarcely a season passes in these days of rapid transit and general exchange of products, that some pest is not unwittingly brought to our shores and introduced to conditions that stimulate its prolificacy, vitality and adaptiveness.

Among these destructive foreigners none is more notorious than the Codling moth, the parent of the principal "apple worm," an insect as cosmopolitan as the Anglo-Saxon race and the apple-tree by which it is accompanied. Several others of our worst apple-tree pests, such as the Oyster-shell Bark-louse, the Woolly or Root aphid and the Leaf aphid, are also European. Other immigrants of like evil report are the Hessian fly, the imported Currant-worm, the imported Elm-leaf beetle, the European cabbage-worm, the Gipsy moth, and many others.

Now, in these references to the variety and destructive powers of insects, I am sure no cultivator of the soil will accuse me of exaggeration. Having, therefore, recognized the enemy, it becomes the part of discretion to learn as much as possible about its habits, its modes of attack, its natural antagonists, and what methods of warfare promise to be most effective against it. The considerations are the *raison d'être* of the new profession of the economic entomologist. Twenty-five years ago there were not a half dozen workers in this field in all the United States; now there are hundreds of enthusiastic and indefatigable students at work upon the complicated problems of the subject.

It is obvious that the practical farmer and fruit-grower has not the time nor the taste for investigating the habits and life histories of the insects which trouble him. In many cases these are very obscure, and the points that we miss are in all probability the key to the situation in dealing with them.

As an instance of this may be mentioned the Hop Plant-louse, an insect which causes hundreds of thousands of dollars of loss annually, both in England and in this country. It was impossible by any application to preserve the vines from its ravages, and equally impossible—because no one had been able to trace it through its cycle of development—to prevent its appearance on the vines.

After long and patient research in the hop-growing regions of England and the United States, Dr. Riley, of the U. S. Department of Agriculture, made the interesting discovery that the resting stage was passed upon the plum tree; that

ate in summer the winged Aphides deserted the hop fields and migrated to any plum-trees that might be in the neighborhood. Upon these the sexed forms were produced and the eggs were laid. The latter hatched in the following spring, and the young lice fed upon the tender foliage of the fruit-trees until they had attained their wings, when they returned in swarms to the young hop-plants.

Now it has been found comparatively easy to destroy the fall brood of the insect after it settles on the plum in autumn, and its eggs during winter, and, by taking these precautions, the hop fields of England and many in America have been for the past two or three years preserved from serious devastation.

In this connection, I may mention that one reason why plant-lice are so difficult of extermination is that many species which inhabit one plant or one part of a plant at one season of the year, at another season are found on very different plants or in different situations on the same plant; and there are reasons for believing that many very pernicious species hibernate unsuspected upon the roots of perennial weeds.

The life histories of many other kinds of injurious insects are equally difficult of elucidation.

It will be seen, therefore, that these matters require time, experience and laborious investigation, and these can only be given by the professional entomologist, with adequate means for experimentation and assistance. When once he has arrived at a satisfactory result, and can trace definitely every step of the process, he is in position to give valuable advice to those in need; and where his directions are followed to the letter, the effects are almost without exception satisfactory. In the use of such substances as Paris green or kerosene, so much depends upon the manner in which they are applied, that the greatest care should be taken, otherwise the consequences are apt to be disastrous. My friend Mr. Gilbert will pardon me if I quote from a letter of his illustrating this point. He writes:

I received your favor some time ago asking for a brief sketch of my spraying this spring. . . . It is a short story. I cannot plead ignorance, because I have listened with great interest to the discussions at our meetings about just how to do it. You know it is one thing to receive good advice, and quite another thing to make good use of it.

In preparing to spray my peach-trees, I did not get the nozzle I ordered. Bought my pump of the Field Force Pump Co., Rochester, N. Y. They sent me a graduating nozzle, and I could not get a fine spray. So I weakened the solution, and used one pound of Paris green to four hundred and eighty (480) gallons of water. Instead of *spraying*, I *drenched* the trees that were all loaded with peaches. In a week the leaves began to fall and the fruit to shrivel up, and in two weeks that part of each tree that had received the heaviest drenching was entirely denuded of fruit and foliage, except from three to five of the youngest leaves on the most vigorous shoots. Some young shoots were totally destroyed in ten days after spraying.

Upon recommendation of Secretary Goodman at our June meeting, I cut back those that were most injured to stubs: that is, I left the larger limbs eighteen or twenty inches long from the trunk of the tree. In two weeks they put out new shoots, and have made a good growth, and will fully recover in two years. Prof. Clark recommends the Vermorel nozzle, and this is the one I will use in future.

While this lesson has been a dear one, I do not feel discouraged, but will spray thoroughly next season.

Yours very truly,

S. W. GILBERT.

Although I knew the foliage of peach to be exceedingly sensitive to the action of the arsenites, yet, considering the weakness of the solution, the misfortune attending Mr. Gilbert's experiment is surprising, even to me.

In a similar strain was the complaint of another correspondent, who had been recommended to spray young apple trees that were badly infested with aphids, with a very dilute kerosene emulsion, and who informed me later that the foliage was scorched brown in patches. Upon investigation, this gentleman was found not to

have made an emulsion of the kerosene at all, but had simply added to some strong soap-suds a small portion of the oil. Thus the latter was not properly incorporated with the fluid, and was very unevenly distributed, hence the damage. It is seldom safe to use kerosene until it is thoroughly emulsified with soap-suds or milk by means of the most thorough agitation—if a large quantity is desired, by forcing it back and forth through a spray nozzle of a force pump; if only a small quantity is needed, it can be made by rapid churning in an old churn, or in a patent egg-beater. The cream that rises after this mixing is the emulsion, and dilutes evenly and readily with more or less water. The most easily remembered proportions for the preparation of the emulsion are, two gallons of the oil to one gallon of hot water in which one-half pound of soap has been dissolved.

But there are many indirect as well as direct modes of warfare with these insect foes. By a thorough acquaintance with their habits, we can prevent many species from gaining access to the plants on which they are the most injurious. Thus, knowing that the females of the Canker-worm moth, the Lime-tree Winter moth, the Tussock moth and various others are wingless, and, in the case of the two former, issue from the ground late in autumn or very early in the spring, and have no means of reaching the branches and twigs upon which they prefer to place their eggs except by crawling up the trunk of the tree, it readily appears that by surrounding the latter with some trap or barrier over which they will not be able to make their way, they will be prevented from placing their eggs where the worms hatching from them will do damage. For this barrier I have found nothing so easily adjusted, inexpensive and effectual as a band of loose cotton batting three or four inches wide, made to encircle the tree trunk at a height for convenient examination, and fastened with a tack and tied around the middle with twine.

The female Canker-worm moth has long, feeble, spider-like legs, which become entangled in the cotton and effectually prevent her progress up the tree, and she very soon perishes in her struggles to free herself. That this preventive measure will in a short time enable the orchardist to conquer this pest, we have satisfactorily proved in our own small orchard. Three or four years ago the trees were very badly infested, and scarcely recovered during the remainder of the season from the defoliation caused in the spring by this insect. Since then the cotton bands have been regularly applied, and during the present year scarcely a canker-worm was found on the trees. The larvæ of climbing cut-worms and many other insects are also caught in the cotton. These bands should be turned up once or twice a week during March and April, and such eggs as are found, crushed; but in these situations they are not likely to escape the species of Carabid beetles which have learned to look there for food. Spiders also have been found devouring the imprisoned moths. *A sure preventive is better than the best remedy.*

Another method is to keep a sharp watch for weeds on which so many pests of the garden or orchard are fostered during part of the season, or in certain stages of their development.

A number of years ago I discovered that the Striped Flea-beetle (*Phyllotreta sinuata*) in its larva state mined the leaves of the wild Pepper grasses (*Arabis* and *Lepidium*), and later I found that it was on these weeds, almost exclusively, that it bred, although in the perfect or beetle state it was exceedingly destructive to young cabbages, radishes, turnips, and all cultivated *Cruciferae*. The weeds in question were then especially *tabooed*, and are now very rarely found on our grounds; and the consequence is that we are no longer troubled with this destructive flea-beetle. The Potato flea-beetle is fostered by the Horse-nettle (*Solanum calolinense*); the second brood of the pernicious spotted Cucumber beetle breeds on wild *compositae*;

the Spinach-beetle (*Disonycha collaris*) is tided over the mid-summer months on the succulent leaves of the Pig-weed or Lamb's-quarter (*Chenopodium album*); the first brood of the Grape-berry moth (*Eudemis botrana*) shows a somewhat remarkable change of habit by breeding in the growing points of the Iron-weed (*Vernonia*); and I might extend this list almost indefinitely.

It is evident, then, that by a thorough eradication of all these weeds, we not only benefit our crops in the usual ways, but lessen their liability to attack by insects.

Another set of tactics in this never-ending campaign is the encouragement and protection of all cannibal and parasitic species, so far as possible. It is by means of these that nature keeps the balance between vegetable and insect life. Every insect has some of these natural checks, which eventually reduce it to non-formidable numbers. The lack of these is what causes insects of foreign origin to multiply so rapidly and be so destructive. In their migration, enemies of their own class are left behind. Dr. Riley took this fact into consideration some years ago, and has, in several instances, met with great success in introducing parasites and predatory species from the same countries in which the vegetarian pest was indigenous. In a paper read before this Society at the Poplar Bluff meeting, I had occasion to refer to one of those instances in the introduction into California, from Australia, of a small Lady-bird beetle (*Vedalia cardinalis*) which, in the course of two or three years, has cleared the orange groves of a peculiar and very destructive scale insect that had itself in some way been brought from Australia. Similarly in the case of the European cabbage butterfly: It was known that, in its native habitat, it was kept in subjection by several species of parasites. The most important of these Dr. Riley had collected and brought to this country while in the cocoon state by special agents. When the flies emerged they were liberated in the cabbage fields near New York, Washington and Philadelphia, and at once attacked the cabbage worms which had for some years occasioned such great loss to gardeners, and now, in the course of five or six years, have multiplied and disseminated themselves over all the Eastern states.

Last year one species (*Apanteles glomeratus*) was reported in Ohio and Michigan, and this season I had the pleasure of finding it on about fifty per cent of the worms in the cabbage gardens of Kirkwood and vicinity.

Almost simultaneously with my discovery, a correspondent, Mr. C. P. Fox, of Columbia, sent me a large number of specimens, with the information that it had destroyed about eighty per cent of the worms in his locality. As some of you may wish for a description of an insect so valuable and so traveled, I may say that it is a small, dark-brown, four-winged fly, about half the size of a mosquito. The wings are iridescent and transparent, except for a small opaque triangular brown cell on the anterior edge of the upper pair.

These flies hover over the cabbage worms and insert their eggs in the skin of the latter. From these eggs hatch numerous minute grubs that feed upon the tissues of their host, under the skin, for about ten days, when, as the worm perishes, they work their way to the surface and cover its shriveled body with a dense mass of pale-yellow, silken cocoons, from which, in a short time, a fresh brood of the flies issues.

I might detail other instances of similar importations and exportations, and this is a sort of international exchange that promises to be of great importance. Even Mr. McKinley's tariff bill imposes no duties on articles of this sort, and there is complete reciprocity between all countries so far as these productions are concerned.

In conclusion, I must briefly refer to one other agency that is being brought into requisition for the elimination of pernicious insects; this is the discovery of artificial methods of propagation and dissemination among them of fungus diseases. Eight or nine years ago the subject was broached by Prof. Forbes, of Illinois, who detailed before the American Science association a number of most interesting and successful experiments in transmitting disease from a few artificially inoculated insects to great numbers in their natural breeding places. A few years later Dr. Lugg, of the Experiment station of Minnesota, had marked success in exterminating chinch-bugs and grasshoppers by means of certain fungi. But it remained for Prof. Snow, Chancellor of the Kansas State university, to achieve during the present season a national renown in connection with "Chinch-bug cholera," as it is popularly called. Beginning early in the spring a series of cultures of *Empusa* and *Sporotrichum*, he kept constantly at hand a supply of diseased bugs, which were distributed, with explicit directions for use, to those in whose fields of wheat or other grain the bug had appeared in injurious numbers. And in many cases it was claimed that the introduction of the disease destroyed the pest so quickly and so completely that the threatened crops escaped injury.

It will be seen from this hasty *resume* of the subject that Economic Entomology has, in the short time that it has received attention, proved itself a valuable auxiliary to the agriculturist, and has already worked out many problems in insect life and related fields of study, the value of which, in dollars and cents, would more than repay all that the State and National Governments are expending upon the encouragement of agricultural science. And as yet only a fair beginning has been made. We may look to the future, under a favoring Providence, for the discovery of methods of preserving all the golden wealth of our grain fields, all the luscious fruitage of our trees and vines, and all the varied beauty of form and fragrance and color of our gardens. This can only be achieved by labor of hand and brain, but this labor will be definite, and will secure definite results because based upon accurate knowledge and true philosophy.

MARY E. MURTFELDT, Kirkwood, Mo.

THE LAWN.

Verdant grass, stately trees, spreading shrubs and cheerful flowers are the few modest materials with which kind nature has woven the brilliant carpet that decks the bare face of mother earth. Can we behold and enjoy this endless variety of nature's scenery without remembering the scriptural passage: "The Lord planted a garden, and therein he put the man that he had made?" All efforts made, in whatever way, to surround our homesteads with a crude miniature garden, an atom at least of the original one made for man's dwelling place, are natural offsprings from the esthetic principle planted by the Creator in the human mind. This impulse of sympathy with the beauties of nature is the fundamental source from which all that we proverbially call art has emanated. Designing and decorative horticulture is most assuredly a branch of the same root and stem, and may boldly take her stand, with humble spade in hand, alongside the painter and the sculptor. But for fear that we are trying to fly too high, we will stay on the ground, on which lawns are generally made, and let mankind judge in after years whether our work was artistically designed and executed in its day.

There is, by the way, one peculiarity with all works of horticultural art. They are open to everybody's gaze, unless surrounded by a high stone wall like Shaw's garden. They are open and welcome to all mankind's enjoyment, but

subject in the same ratio to everybody's criticism. The surest way to attract and to hold the public eye, to give enjoyment to the greatest possible number of beholders, and to escape unkind remarks of the passing crowd, is to make our work as near and true to the patterns of nature's scenery as we possibly can.

A lawn neatly kept, and similar to forest or meadow scenery, as though cut out of some beautiful spot of nature, will be admired by every passer-by, will send a thrill of joy through every mind however dull it may otherwise be, and will never cause that species of ennui experienced at the daily sight of an artificial and grotesque combination of lines of trees and cunning floral designs.

The desire for a pleasant green sward, enlivened here and there by shrubs and flowers and protected by the genial shade of foliage overhead, is a universal impulse of the people in town and country. Amidst the innumerable efforts made in this direction, various mistakes made by those unacquainted with the matter must naturally be expected. One class of would-be lawn-makers do too little to secure reasonable success, while another class, more enthusiastic than their neighbors, do too much of a good thing for the yard. We see hard-pan soil, barely sufficiently leveled to receive the seed, or to be sodded, expected by the owner to bring forth a verdant stand of grass. Quite often the soil is made too rich, and runs to weeds instead of to the grass desired.

One man will plant the commonest trees obtainable, at least cost; another fills the yard so full of valuable stock that one-half of it must be crowded out by the fastest growers. Yet enough of mentioning mistakes made by other well-meaning people.

Due consideration must necessarily be given to all physical conditions indispensable to a pleasant and healthy dwelling place. A wise line of demarkation between oppressive sunshine and damp, gloomy shade must be drawn foremost for sanitary considerations. Good judgment, in other words, must lay the foundation for the lawn as well as for the household at large.

Fitness and congruity of parts combined must please the senses and satisfy the mind. Unsightly objects should no more be suffered on the lawn than they would be tolerated in the interior of the house. The lawn should be in reality the outside reception room and summer parlor of the family.

It expresses, whether people like it or not, the grade of culture and refinement of the inmates of the house. Be it ever so small or unpretending, let it be clean and tidy all the time.

As tastes and preferences vary so infinitely, and as each locality has its own peculiarities, necessities and possibilities, no general suggestion as to mode of decoration can be ventured. The woods and prairies and brooks and dales, amidst which we live and move, offer innumerable hints and patterns for the garden in the midst of which the Creator desires us to live, that no one wishing a truly American homestead need to go to England, the land of landlords, for information how to make an inviting lawn west of the Mississippi river.

All that we need is the key to read nature's book on scenery, with the quick perception so peculiar to the people of our land.

We meet a beautiful grove, whose canopy of boughs and foliage is pierced here and there by the bright rays of the sun; and what a charming reflection of shade and sunlight is shed on the green turf underneath. How great a variety of lessons for lawn-planting can the musing observer deduct from an accidental group of nature. We need occasionally the margin of a water-course, lined by a mass of spreading shrubs and vines, grown up in native freedom, truly enchanting to behold. How pleasant and effective barriers this would be to shield our lawn from the universal aspect of the neighbor's yard.

Can we not see at a glance how to secure privacy for the lawn, how to hide and to plant out what we do not wish to see, and take the many charming contrasts of form and foliage as grouped by nature out in the woods, study them carefully and then try to produce similar effects in harmony and contrasts, when you attempt again the improvement of a lawn.

A close observer of the gradual and slow development of sound judgment in matters of art, in the realm of designing horticulture, amongst the large class of people taking a deep interest in horticultural progression in general, must often wonder what the cause may be that in this artistic age, and with all the treasure yearly expended for more elegant homesteads arising in all directions, so little visible progress is made in the decoration of grounds.

How few are in our State, the lawns surrounding costly mansions, that can lay claim on any real and artistic value, or can compare with the leading ornamental grounds of other sections of the land.

Let it be remembered what influence a more liberal number of "Object-Lessons," of truly beautiful lawns created in the leading towns and cities, would exercise throughout the State at large. To foster and to encourage this much neglected cause is surely a solemn duty of this time-honored and progressive State Horticultural Society.

M. G. KERN, St. Louis.

PROGRESS AND PROSPECTS OF THE HORTICULTURISTS OF MISSOURI.

Some time ago it was suggested at our local society that I should give a talk at one of its meetings on insects, and when requested to give the subject for a paper to be read at this meeting, I replied that I could not think of one with which I could sufficiently interest the meeting, and had dismissed from my mind all thought of preparing any paper at all, but on receipt of a copy of the program, I found my subject announced as "Bugs."

The term is very indefinite. It brings up one idea to the mind of the good housewife who has had experience in the various difficulties of housekeeping, and a very different one to the farmer who has had all kinds of insects preying upon his grain, his vines, his vegetables and fruits; and without classifying the different insects which caused the trouble, he thinks of all of them under the term assigned as my subject.

In taking this meaning of the word, the Society can have pride in the fact that the present United States Entomologist was formerly a resident of this State, and an active member of the Society; and that while here holding the position of State Entomologist under the State government, he published nine annual reports, which were of great credit, not only to him, but to the State, and not equaled by any other state in the Union.

These reports were published in the State Agricultural reports, and a set of them will readily sell for \$20 or upward. But Prof. Riley was not the only entomologist belonging to the Society. I find in its old proceedings the reports of entomological committees, and articles by various persons on similar subjects, showing intimate knowledge of these matters, while among our members still is one who is known everywhere as a writer and collector in this department. She holds the honorary position of entomologist to this Society, and a member who invades Miss Murtfeldt's field should be sure of his familiarity with the subject which he may choose.

The term might be used in still another way, but if I wanted to write about the "big-bugs" I would probably need to buy a copy of McAllister's work on the

"four hundred" of New York, and study up the subject as presented by him, of that circle against which so many declaim, and yet stand ready to expend large sums of money to be allowed to enter.

But the term suggests something that is unpleasant, and unpleasant things often come from difficulties encountered; and so, in thinking over the program announcement, I was led to think of the progress that has been made by the farmers and horticulturists of the State, and the difficulties they had to contend with in doing this.

While lately reading some books of early travels in our State, I was impressed that this progress, made since Missouri became a State, some seventy years ago, is truly wonderful. Schoolcraft, writing from Potosi in 1818, says: "I begin my tour where other travelers have ended theirs, on the confines of the wilderness, and at the last village of white inhabitants between the Mississippi river and the Pacific ocean."

It takes a little thought to realize the full force of this assertion. In addition to St. Louis, a number of towns had been founded by the French, and St. Charles, Ste. Genevieve, Carondelet, Cape Girardeau, St. Michael, now Fredericktown, and other places date from that period in our history. These towns were in the eastern part of the State, and principally on the Mississippi river. In their neighborhoods, and scattered all along in the vicinity of the rivers, farms had been laid out. Already the hardy emigrant had pushed westward up the Missouri river, and about the time that Schoolcraft wrote, and in fact a year before it, at least two towns, Franklin and Boonville, had been laid out, while along the river farms were being put under cultivation.

Schoolcraft made his trip from Washington county through Crawford, Dent, Texas, Douglas, Ozark, Taney and Christian counties, and on his return trip passed through the tier of counties next to the Mississippi river. Along his route bear, deer and elk were plenty, and buffalo were still abundant in the southern part of the State. In Taney county he found two hunter-farmers, who had just erected cabins, and this, he declares, was the most remote bound to which the white hunter had penetrated in a southwest direction from the Mississippi river toward the Rocky mountains.

While even the hunter-farmer had extended no further in that direction, in lines more directly westward there were, perhaps, only the two towns before mentioned. Kansas City, St. Joseph, Council Bluffs and all the cities and towns of Kansas and Colorado, then did not have even a solitary farm-house to mark the sites of the present thriving cities.

By the census of 1820 the total population of the State was 66,586, or about double the present population of this (Pettis) county. There was then a strip extending along the Mississippi and Missouri rivers having a population averaging between two and six to the square mile, with a small tract about St. Louis, and another one on the north side of the Missouri river, near the western border of the State, having a somewhat denser population. In 1830 the inhabited territory was enlarged, but the most of the State south of the Missouri, except near the Mississippi, as well as a large part of North Missouri, had still less than two persons to the square mile. Ten years later there was a strip on the north, one in the south-central part and one in the extreme southeast part of the State with this scant population; in 1850 there was still such a tract in Southern Missouri, so that during the last three decades only has the entire State been settled past the hunter-state density.

The agricultural progress may be approximately seen from the number of million acres of land in cultivation in the State by the censuses of 1850 to 1880, being in round numbers, three, six, nine and seventeen. The total acreage then in farms was about 28,000,000, and the total in the State, 44,000,000.

The evidences of the progress of the agricultural classes in the past are seen not only in the great increase of improved land in the State, and the still greater and wonderful increase of acreage devoted to orchards, but they are also seen in the elevation of those who engage in these pursuits by the more general dissemination of education, by the establishment of an agricultural college by the State, and of a botanical garden and school in St. Louis, by the well-attended annual meetings of this Society, and by the publication of the proceedings of its thirty-three annual meetings.

The future progress will be aided by the realization that those who till the soil and raise our fruits need a varied knowledge as certainly as the lawyer or doctor, and more certainly than the merchant, and the attendance upon schools and colleges which will make the farmer educated should be encouraged.

When society was rude, and a very small outlay would procure all the clothing and food which were thought necessary in addition to that raised on the farm itself, but little knowledge was requisite. Later, when it was found that simply existing and having enough to eat and wear so as not to terminate that existence by suffering hunger or cold, was a very low plane of life, a step upward was made.

By the increased competition of the greater number, it was found that he who could obtain the greatest amount in proportion to the labor expended had an advantage over him who made no improvement on the rest. The one who could show money returns from his increased stock of knowledge induced his neighbors to place themselves or their children on a par with him, and so the tendency of the total as a class was upward.

If the farmer properly understands the soil he cultivates, he will learn it through chemistry and geology. The soil varies according to the kind of decomposed rock which has formed it. If from magnesian limestone, it may have much phosphate of magnesia; if from granitic rocks, it may have much potash from the feldspar or albite in them, and so on of other constituents. If they were in the rock that has been decomposed, they will be in the soil formed from it.

Chemical analysis of any vegetable product will show of what it is composed, and if all its constituents are not in the soil, those wanting must be supplied. If the farmer plants the same crop every year, and uses no fertilizer to replace the elements that he takes from the soil, he soon finds that his crop becomes less each succeeding year. He is wearing out the soil, and if he does not replace what he takes away from it, it will become barren.

Scotland was at one time comparatively unproductive, but by the application of scientific principles it became one of the most productive in Europe. Formerly Virginia and other parts bordering the Atlantic ocean were as fertile as any in the West; now thousands of acres are lying waste in Virginia, and in New England farms are abandoned, because they are no longer profitable to cultivate. The uplands of Southeast Missouri became exhausted, but by the application of the teachings of science the production is now two-thirds more than it was a few years ago.

Botany is of benefit in the three departments of horticulture—pomology, floriculture and vegetable gardening. Prof. Lindley says: "Good agriculture and horticulture are founded upon the laws of vegetable physiology. No man deserves the name of gardener who is not master of everything known as to the way in which

plants feed, breathe, grow, digest, and have their being." And Prof. Beal says that botany will make the horticulturist "a good observer, improve his reason, strengthen his judgment, cultivate his taste, broaden his views, weaken his respect for the traditions of his father. It will sharpen his wits and make him an investigator."

Illustrations might be multiplied to show how the natural sciences are connected with the work of the horticulturist, and if he is competent to decide the questions which are constantly arising, he must know these sciences to some extent at least. Let him and his children learn all they can of every study that can teach a fact or make a suggestion in the line of this work, by availing themselves of the teachings of the agricultural colleges, of the agricultural experiment stations, the transactions of the agricultural and horticultural societies, and the current events and teachings of the journals devoted to these subjects.

F. A. SAMPSON, Sedalia, Mo.

A HISTORICAL PEACH-TREE.

J. C. Evans—Before we adjourn I want to tell you of a peach-tree found in Douglas county, Missouri. On one of the bald knobs of that county grows a large post-oak. One of the roots of this oak runs along on the top of the rock for some ten or twelve feet. This root is larger than my body. In it is a hole out of which grows a peach-tree. About every ten years the peach-tree dies and a sprout comes from the root. Every year that tree is visited by some Indians who lived in that vicinity years ago. The old settlers have by some means learned from them that that tree is a land-mark. Tradition says there is a rich mineral deposit where that peach-tree grows. Only a few people know where it is, for it is in a very wild country. No peaches were on the tree this year, for it is only about two or three years old. It is a beautiful tree, in fine shape. I understand that it has borne fruit in past years, for I have talked with people who had eaten fruit from it, off and on, for twenty-five years.

A. Ambrose—I think the President should have told that story before our Kansas friends went away. To change the subject, I think it is not advisable to make a display of nursery stock at the meetings of this Society.

Sam^r Miller—I don't think it is any out of the way for the nurserymen to make a display.

Mr. Ambrose—Very few of the large number of nurserymen who are members of this Society have ever taken advantage of this means of advertising their stocks.

A. J. Blake—I think we would all be benefited if there was a larger exhibit of trees at our meetings.

Dr. Curry—I think it would be an education to us who are young in the business. I have learned very much from the exhibit here now. I think it would be a good idea for all nurserymen to show their trees.

Mr. Ambrose—If we did this it would grow larger from year to year, and we could not find room for all who want to show.

A motion was made, that large exhibitions of nursery at the meetings of the Society was not desirable, as it would take too much space. The Secretary suggested that such things regulate themselves.

TREASURER'S ACCOUNT.

J. H. LOGAN, Treasurer.

Cr.		
July 1, 1891....	Balance credit from June report.....	\$50 41
	Paid out for premiums at St. Joe.....	67 40
	Certificate of deposit Citizens' bank.....	1,447 76
		<hr/> 1,565 57
Dr.		
July 7, 1891....	Received from D. S. Holman's estate.....	297 62
	Received from State Auditor.....	1,250 00
		<hr/> 1,547 62
Dec. 4, 1891....	Balance, settled and paid.....	17 95
		<hr/> 1,565 57

The Society holds a certificate of deposit in the Citizens' bank of Nevada for \$1,447.76, and it is closed.

Copy of certificate is hereby submitted, but the probabilities are not very flattering for its payment:

NEVADA, Mo., Nov. 28, 1891.

To whom it may concern :

This is to certify that J. H. Logan, Treasurer, has been allowed his claim of fourteen hundred and forty-seven 76-100 dollars against the estate of the Citizens' bank of Nevada, the above having been registered as an *allowed claim* of September 7, 1891.

JNO. H. PRIMELL, Assignee.

By this report you will see that on July 1, 1891, the Society had in the hands of J. H. Logan, Treasurer, \$179.81. On July 15th, I made requisition on the State Auditor for our semi-annual allowance, \$1,250.00. This draft was received by Mr. Logan and deposited in the Citizens' bank on the 7th. On the 9th the bank closed.

Hundreds of people lost thousands of dollars, and Mr. Logan had in the bank over \$1,000 of his own at the same time, having deposited it there the day before it closed.

It has been the custom of this Society to not keep much money in the banks, and warrants had already been drawn to use most of this money as soon as it was received. But when Mr. Logan received the warrants the bank was closed.

The work of the Society was very much interfered with, and many preparations for putting up fruits in glass jars were stopped, for it was the intention of the Society to put up all the small fruits and peaches, and grapes and pears, ready for the exposition.

Since then we have had to draw the money as we used it, and have hardly been able to keep up with our expenses and printing at Jefferson City.

L. A. GOODMAN, Secretary.

TREASURER'S REPORT.

Cr. June, 1891.....	Expense of Secretary at St. Joseph.....	\$4 10
	Express, 60; cold storage, \$2 20.....	2 80
	Paper, plates, pencils, etc.....	3 70
	Mrs. Ramsey, expenses.....	3 00
	Express, 85; hotel, \$7.25.....	8 10
	"Herald" (150) \$3.50; Blake, expenses, \$1 75.....	5 25
	R. R. tickets, \$1.40; exp., 80; "Jour. of Agr." \$1.50..	3 70
	Postoffice, June (bill 2).....	40 45
	Postoffice, July (bill 3).....	7 62
	Freight on reports (bills 4, 5, 6, 7).....	12 51
	Paid Miss Murtfeldt (bill 9).....	50 00
	Postoffice bill, August (bill 10).....	31 99
	Freight (bill 11).....	6 21
	Tribune Printing Co. (bill 12).....	265 65
	Express, 85, \$1.10, \$1.60 (bills 13, 14).....	3 55
	Freight (bill 15).....	3 93
	Paid Mrs. Laughlin, expenses.....	6 50
	Paid Zimmerman, premium.....	1 00
	Paid Hans Neilson, premium (bill 16).....	25 00
	Postoffice bill (bill 17).....	19 55
	Printing bill (bill 18).....	7 90
	Postoffice bill, September (bill 19).....	3 42
	Paid Mrs. Dugan, St. Joseph.....	8 90
	Salary, June, July, August (Secretary).....	200 00
	Printing bill (bill 20).....	6 50
	Postoffice bill, October (bill 21).....	12 67
	Expenses to Sedalia and return.....	6 50
	Printing program (bill 22).....	24 20
	Expenses to Jefferson City and return.....	11 40
	Kansas City paper house (bill 23).....	11 35
	Express, 70, \$1.10, 85.....	2 65
	Postoffice bill, November (bill 24).....	20 35
	Tablets and pencils, etc.....	3 50
Dec. 1-3, 1891..	Premiums at Sedalia.....	146 26
	R. E. Bailey, stenographer.....	30 00
	Telegrams.....	1 10
	E. S. Curry, expenses.....	10 00
	J. H. Logan, " Sedalia.....	6 60
	J. H. Logan, " St. Joseph.....	9 00
	J. H. Logan, money advanced.....	6 00
Balance in Treasurer's hands.....		1,033 55
		8 10
		1,041 65
DR. Oct. 1, 1891....	Warrant State Auditor.....	\$625 00
	Dec. 1, 1891.... Warrant State Auditor.....	416 65
		1,041 65
Warrant No. 178 paid.....		625 00
Warrant No. 179 paid.....		416 65
		1,041 65

J. H. LOGAN, Treasurer.

REPORT OF FINANCE COMMITTEE.

MR. PRESIDENT—Your Committee on Finance beg leave to report that they have examined Treasurer J. H. Logan's report, warrants, receipts and itemized list of same, and find them to be correct as reported, by the Society accepting a certificate of deposit for \$1,447.76 on the Citizens' bank of Nevada, which is closed. We

find that this money was deposited by Mr. J. H. Logan in said bank for the Society on July 7, 1891; that he was acting in good faith, and expected to use the money in a short time in the payment of the warrants of the Society; that he had confidence in the bank, as a deposit of one thousand dollars of his own money on July 8 amply proves. On July 9 the bank closed, and Mr. Logan found himself without money to meet the warrants of the Society, which has been a great loss and hindrance to their work; much very important work that the Society had in view and would have done with this money, has had to go undone; yet knowing that the best of men are often caught by bank failures, and having every reason to believe Mr. Logan perfectly honest, and had no intention of using the money of the Society, we therefore recommend that the certificate of deposit for \$1,447.76 be accepted, and that the Executive committee of the Society use all diligence in the collection of the claim, and in the prosecution of the bank officials, who are undoubtedly criminally liable for receiving deposits after they knew the bank to be insolvent.

A. NELSON,
N. F. MURRAY,
W. G. GANO,
Committee.

REPORT OF COMMITTEE ON FINAL RESOLUTIONS.

Mr. PRESIDENT: Your Committee on Final Resolutions submit the following: The Missouri State Horticultural society, at the closing session for 1891, desires to express in some measure, by resolution, its appreciation—

1. Of the kindness of the Mayor of the city of Sedalia in tendering the freedom of the city.
2. Of the liberality and hospitality of its hotels and citizens in efforts to make our stay pleasant.

Especially would we commend the excellent music which has been furnished; its enlivening and sacred influence will follow each of us to our homes.

We wish to remember the newspapers of the city, which have labored so industriously to call the attention of the people of the State to our meeting, and have so ably and accurately reported our proceedings.

We are also under many obligations to the Mo. Pac. R'y, the M., K. & T., the C. & A., the Kansas City, Fort Scott & Memphis, the Wabash, the Hannibal & St. Joseph, the Atchison, Topeka & Santa Fe, and a number of contiguous railway lines, for substantial courtesies extended to the members of this Society.

These roads are meeting our demands for cheap transportation and are extending courtesies in a spirit of cheerfulness hitherto unknown in railway management.

Information reached this Society to-day that Prof. J. W. Clark, of the Experiment station at Columbia, is about to leave the State. We regret exceedingly to lose the services of this distinguished horticulturist, and we desire hereby to testify to the valued services rendered in his labors among us while a resident of our State.

Finally, we extend the thanks of this Society to the members of the Awarding committee of this session for arduous and faithful services rendered.

CAPT. E. T. HOLLISTER, Chairman.
CONRAD HARTZELL,
R. H. WHEELER.

MISCELLANEOUS PAPERS.

SHEEP ON A FRUIT FARM.

L. T. KIRK, Sedalia, Mo.

The Germans have an old legend connected with the battle of Chalons, in which the hordes of Attila were defeated.

The student of the sanguinary struggles of modern times has little conception of the loss of life on those ancient fields. For three days and nights after the battle—so says the old legend—the spirits of the slain might be seen in mid-air struggling with unabated fierceness for the supremacy.

This old legend has frequently occurred to my mind when I have witnessed the sharp competition among fruit-men, especially berry-growers, in the local markets of our county. I must admit that this struggle has its silver lining: it brings fruits to the homes of the masses; it intensifies cultivation, and that means more barrels, more crates, more baskets to the acre, and in that way only can we make the growing of fruit profitable. On nearly all of these fruit-farms there are the surplus acres, land that from one cause or another is not well adapted to our principal occupation.

The question then is, what shall we do with these surplus fields? One concludes that for him the raising of grain is best. Another thinks of Jersey cows and Jersey butter; still another would solve the problem by making cheese or selling milk.

It has occurred to me that these various attempts at the solution are defective in this, that at the very season of the year when our energies are taxed to their utmost in disposing of our fruits, these subordinate duties are just as exacting as when the buds are dormant in winter time, and they will refuse to pay us a single farthing unless they do receive such attention. Therefore, when it came my turn to attempt to solve the question, the first reason why I selected sheep was that they require the least attention when fruit requires the greatest. The second reason was, that of all domestic animals the sheep is the best adapted to graze in the orchard. No one thinks of pasturing a berry patch at any time, or a young orchard until it has come into full bearing; but from then on, our success will depend largely upon our skill in

using the domestic animals. There are suckers and sprouts, weeds and grasses, that if not kept in subjection will be the hiding places of myriads of destructive insects.

But, says one, "will they not bark the trees?" Yes, sometimes; but less liable to do damage to the trees than any other domestic animal. Then, however small or green the apple, whether sweet or sour, they are relished alike by sheep, while hogs will utterly refuse to touch a sour apple after a day or two. So it will be seen that sheep are one of the very best insecticides so far as our worst apple insect, the codling moth, is concerned. In addition, what domestic animal will come as near keeping these vegetable enemies in check as the sheep? Not content with destroying the codling moth by eating the green and worthless apples, and keeping down suckers and sprouts, weeds and grasses, they are constantly rubbing against the trees, leaving an oil on the bark that is quite offensive to borers and bark-lice.

My third reason for selecting sheep was because of their great value as fertilizers of the soil. These phenomenal crops that we read of are the results of good agriculture, and there can be no such thing without a thoroughly enriched soil. We read that England grows the largest average crops of any country on the globe, while in this country each decade shows a smaller average crop than the one immediately preceding. The census tells us that in England they have four times as many sheep as cattle. In the United States we have eight sheep to nine cattle. Can it be that in these cold deductions from the census we have the cause of England's fertility and our own increasing poverty of soil? It is not necessary to resort to these statements of facts or to any logical process; all the horticulturist has to do is to look at the rich green leaves and the general thrift of an orchard in which sheep have been pastured, and he will require no further argument to be convinced. Then, too, we must not overlook the well-known fact that sheep use the highest points of land as their favorite resting place, and thus enrich the very parts that the elements have impoverished.

In the next place, I argue for sheep that the masses may have healthier and therefore better clothing. Is it not a fact that we produce only four-ninths of the wool that we use in this country, and therefore must pay our millions to other peoples to make up this deficiency? Now, is it not well understood among fruit-growers that we are educating the people to use more fruit and consequently less of something else? Does it not even tax our energies to supply the constantly increasing demand? Does not the same reasoning hold true with regard to the clothing of these bodies of ours? Did you ever notice how warm and comfortably clad were the emigrants from foreign

lands? How soft and healthful their clothing looked? Is there a single reason under the sun why our own people should be clad less comfortably? And yet is it not true that great ship-loads of rags, gathered from one end of Europe to the other, are brought to our shores and made into shoddy cloth for our American people that even the Dagos of Italy would refuse to wear? I say again, I am for sheep, that our people may have healthier and therefore better clothing.

My final reason for selecting sheep was that there was money in them; and I want to remark right here that sheep and fruit are very much alike in one respect, namely, that each will make money just in proportion to the attention that it receives. We have hot-house lambs and hot-house fruits, the one quite as profitable as the other. We have also the sickly, half-starved sheep as well as apple tree. The only value of either is when dead.

Not long ago I was talking with a friend in this city in regard to sheep. He at once produced a letter which he had just received from a sheep man, in which he stated that his income from sheep during the year just closed was \$15,000. I happened to know something of the subsequent history of that man: how he accumulated \$15,000 in another state, then came to this, invested in sheep land and covered it with sheep, and at the end of twenty years his \$15,000 had increased to \$250,000. During a portion of that time he refused to keep a cow or even chickens on his farm for family use. Now, if my figures are correct, there is an annual increase of 60 per cent. My own rate of gain during the past three years has been 90 per cent. So when I say there is money in sheep I speak from my own experience.

You will next ask me as to my preference of breeds. Coarse-wool sheep wander around too much and are too subject to colds and catarrh. I prefer a strong predominance of Merino blood. As to care, I protect them from the storms by straw sheds, give them plenty of salt, grass and water, and, except a daily visit to see that all is well, they do the balance.

I have thus stated my reasons for combining sheep and fruit-raising, and the more I study the combination, the better satisfied I am not only with its financial bearing, but with the excellence of the food which each affords.

DISCUSSION.

Mr. Carpenter—I think it a good paper, but I believe that the contrary is true, and that the specialist will always get there when the competition is sharp. There is enough in the sheep business to occupy the time and the talent of any man. I believe the same is true of the fruit business. I think the same of dairying and fruit-growing.

Mr. Helvern—I have had experience with sheep. I don't think it was the intention of Mr. Kirk to turn sheep into the berry patch or into a young orchard. Their rubbing against the tree keeps away many insects. They will do no harm in an old orchard. We don't want them in the berry patch. In summer time they need little attention. In winter you have the time to care for the sheep.

S. W. Gilbert—This Society has advocated thorough cultivation ever since I have been a member of it. If you give the ground thorough cultivation, there will be nothing there for the sheep to eat. I don't think sheep will find anything in the orchard if we give it thorough cultivation.

J. O. Evans—There will be little corners and spots in every orchard where the grass and weeds will grow. Sheep will clean up these. In an apple orchard the sheep will eat the fallen apples.

D. M. Dunlap—I have had some experience in that line. My sheep were fond of apple bark; they ate it in preference to grass. As my trees seemed to do better with the bark on than with it off, I took the sheep out.

Mr. Mider—I am infatuated with both these last papers. The sheep and cows will give me something to do to keep me out of mischief.

The following letters were read:

SOUTH HAVEN, MICH., Nov. 12, 1891.

Secretary L. A. GOODMAN:

MY DEAR SIR—Seeing the notice of your annual meeting, to occur early in December, I take occasion to invite your attention to the enclosed circular, which, it seems to me, may be the means of adding strength to inducements for becoming members, and thus be made to increase membership, and consequently add to its means of doing good, as well as to its exchequer. The division is desirous to in some such way get into direct affiliation with the horticulturists of the entire country. Please let me hear from you on the subject.

Yours truly,

T. T. LYON.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF POMOLOGY, WASHINGTON, D. C., Nov. 1, 1891. }

To the Horticultural Societies of the United States:

As a means of securing concerted and mutually beneficial action between the Department and persons interested in Pomology and kindred subjects throughout the country, it is suggested—

1. That, through the State Horticultural society or similar organization, provision be made in each state and territory for supplying to the Department for the Division of Pomology a complete and annually corrected list of officers and members of State and local organizations of fruit-growers, with their postoffice address and the specialties in which they are interested.

2. That the Secretary of each State society send to the Department for the Division, as soon as determined, the name of the place and the date of each meeting, and, as soon as issued, the program for the meeting.

3. That each society, state and local, supply the names and addresses of members of a standing committee, consisting of reliable and experienced fruit-growers, to respond to the circulars of inquiry which may from time to time be sent out for the Division.

The Department, as far as practicable—

Makes free distribution of bulletins and other publications of the Division of Pomology, as well as those of other and kindred divisions, upon the basis of lists of members furnished.

Invites the sending of specimens of new varieties for estimates of probable value; of unrecognized varieties for identification; and of known varieties from localities in which they are specially successful, for examination and description. On application, mailing boxes and franks will be sent for such purposes.

Distributes at certain times a limited supply of seeds, scions or plants of imported or little-known fruits; and these are placed for testing in localities where they are likely to receive proper care and suitable conditions of climate and soil.

The proposed co-operation will be greatly aided if the regular meetings of the societies of adjacent states are so timed that they do not occur on the same dates. This will make possible in some cases the attendance of a representative of the Department at a series of State meetings, and it is suggested that the Executive Boards of State societies consider this when arranging for the dates of their annual meetings.

Very respectfully,

EDWIN WILLITS, Ass't Sec'y.

ST. LOUIS, MO., Nov. 18, 1891.

L. A. GOODMAN, Westport, Mo.:

DEAR SIR—I am favored with a program of your 34th annual meeting, to be held at Sedalia, Mo., and am pleased to note that the material is of such a character as to assure one and all an interesting meeting. There is, however, in my estimation, a decided lack of practical floricultural matter—giving rise to the question as to whether your membership is composed to any considerable degree of florists, and whether they have any particular interest in floricultural matters. Having had only general information with reference to your Society, I shall be pleased to know what proportion of the membership is composed of florists, and also what are your membership fees?

We notice that \$20.00 are offered for floral display: have you reference to cut flowers or plants? and in the event we should send goods to the meeting, will they be properly cared for, or would we have to have an agent of our appointment? We are not surprised to note a

change in the mode of awarding premiums; it seems that the dissatisfaction with reference to the methods of awarding premiums is very general.

The St. Louis Florist club, last year, tried the plan you propose, when it had the awarding of \$1,500.00 on plants and floral decorations at the exposition. The result was general dissatisfaction among the members, because there was not as much cause for the member to exert himself to the utmost, as when there were only three premiums offered, and the difference between the three was very considerable, so that he should always strive to get the highest; but your new plan has supporters here, and I shall be pleased to have you report to the Florist club after your meeting, as to how the plan has succeeded with you.

The Chrysanthemum exhibition of the St. Louis Florist club, held here last week, proved a success financially.

An answer from you, with reference to the floral exhibit, will be much appreciated.

Yours truly,

E. H. MICHEL,
President St. Louis Florists' Club.

HALE, Mo., Nov. 21, 1891.

L. A. GOODMAN, Westport, Mo.:

DEAR SIR—I received a few days ago from you a program and invitation to your next annual convention of the Horticultural society of Missouri, to transact business, at Sedalia, December 1st, 2d and 3d days of that month. My sympathies and well wishes are extended to you, one and all, as hearty and unselfish workers for the good and welfare of the State you represent.

The insinuation in the letter of invitation to your meeting that, if I had any light as a horticulturist, I ought to let it shine, I take in good faith, and accept the challenge by striking a match in the dark and try to shed and get more light in that direction.

I have been engaged in fruit-growing on the bluff side of the Grand river for about fifteen years, especially the growing of apples, and some little of small fruits. I have now an orchard of twelve acres, little, big, young and old trees, of the standard varieties, such as: Summer—Red June, Astrachan; Fall—Maiden Blush, Grimes' Golden; Winter—Jonathan, Ben Davis; in the lead—Willow-Twig, York, Imperial and Small Romanite. For the last few years, so far as profits are concerned, the revenues from the orchard beat all other branches of the farm industry badly. The last harvest of apples I could not supply the demand for Jonathan, and it is very productive with me. If I would not

sell them to my customers they would steal them. What of them I tried to keep for my own use they would not steal them, but somehow, in the language of the late lamented Lincoln, take them "unbeknownst to me." I have not one at this date.

The Ben Davis is unrivaled for profit. The last harvest I sold at the base of fourteen young Ben Davis apple-trees, seven years from setting in orchard, \$18 worth, strong measure, which is at the rate of \$65 per acre, thirty feet apart for the trees, or \$32 per annum, making allowance for off years. "*A little more grape, Capt. Bragg,*" a little more light, Bro. Goodman and the other representatives of Missouri apple-growing districts. If you can beat such a showing, say so; I throw out a challenge to every one of you—from top of the Ozarks to the loess hills of Holt to eastern extremity of Missouri. Show your hand and beat my figures.

I am not competing for premium for the best fruit land, but want more light as to comparative productiveness of the different fruit-growing districts of this State under near the same circumstances.

One of my Ben Davis trees, seven years from transplanting, yielded six and a half bushels, strong. The challenge is out—fair warning. I can qualify to my statements if need be. Let me hear from all of you representatives at your next annual meeting, or forever hereafter hold your peace as to being the banner apple district of the State. Don't all speak at once. The weapons of my warfare are mighty to pulling down strongholds.

This communication is from the loess hills of the Grand river slope, pronounced, by way of reproach, "clay hills," or the place to make a brick-yard.

With well wishes, I hope you and your brother horticulturists will have a profitable and edifying meeting, and that you may be able to recruit every county into your ranks in this State, and every scientist whose knowledge is intimately connected with successful fruit-growing.

F. M. TURNER.

P. S. Owing to physical and mental infirmities, I must decline to accept your polite invitation to be with you.

F. M. T.

FOX CREEK, St. Louis Co., Mo., Nov. 19, 1891.

Hon. L. A. GOODMAN, Westport, Mo.:

DEAR SIR—Your kind invitation to meet with State Horticultural society at Sedalia 1-3 December, was duly received. I am just recovering from an attack of pneumonia, and regret that neither my health or work will permit of that luxury.

I have, for thirty years, been collecting material for "recollections," and may sometime get them into shape.

With kindest wishes to all, and your esteemed self in particular,
I remain yours, most truly,

WILLIAM MUIR.

P. S. Program of 34th annual meeting to hand. Thanks.

POWERSVILLE, Mo., Nov. 24, 1891.

MR. L. A. GOODMAN—DEAR SIR: I would like to meet you at Sedalia, but I can't be there. I wish you all a pleasant time. There were several thousand young trees set out in this county last spring. Since we have got a market for what fruit we raise, people have begun to take an interest in planting and taking care of their trees. Three years ago the first apples were shipped from here to amount to anything. Martin & Staton, of Powersville, paid out \$2,700 for apples this year. Our apples were of fair quality this year; crop was not as heavy as last year. Pear-trees in this county were very full of fine pears. Good crop sour cherries. Grapes set very full, but one-third of crop was damaged by black-rot, and young wood is injured considerably. I think it will shorten next year's crop. Peaches almost a failure; what we got were very fine.

Yours, etc.,

J. T. SCOTT.

HOLT, Mo., Nov. 23, 1891.

MR. L. A. GOODMAN—DEAR SIR and BRO.: Program of State Horticultural society to hand, and am sorry to say it will be impossible for me to be with you, on account of bad health; but if I am not with you in body, I shall be in spirit, or as near as it is possible to be, for I am much interested in what will be said and done there. Tell Brother Faith that his wash to keep out the borers will do to tie to; I have used it the past two seasons with perfect success.

I have a seedling apple I thought I would certainly get to this meeting, but I sold them off very close, and while I was sick, the women folks got away with the last of them. I have four small trees that yielded ninety bushels of them, with but few imperfect ones; they are medium or above in size, good color, and the finest flavor; and I have come to believe they are the best all-purpose apple in their season that I know of. If any one wishes to try some of them, I will send scions; I would like to see them propagated. Season, October to 1st of January. I have the history of them, but am too poorly to write more unless I had samples to send.

The apple crop in this part of our county was very near a failure, although I raised between 400 and 500 bushels on a little over an acre of old trees.

I will try and pay my dues by the time of the meeting. Be sure and send me the latest report.

There is one question I would be glad to hear discussed at the coming meeting, and would like better to be there and take a hand : that is, top-grafting the Ben Davis apple. I am confident there is big money in it for the coming generation and the present one too.

In '66 I planted my first Ben Davis apple. The following spring I set a graft in a tree of a long-lived variety. The other Ben Davis came to bearing in due time, and bore many apples and died, and have been grubbed out several years. The grafted came into bearing at the same time, and has borne regular crops ever since, and of better quality, and bore a fine crop this year, and the tree looks as little like giving up as it did ten years ago. If there isn't something in this, why was this thusly?

I remain, yours fraternally,

G. T. ODOE.

KINGSBURG, CAL., Nov. 12, 1891.

DEAR SIR—Knowing that the Muscatel de Gordo Blanco is a superior table grape than any now growing in your State, and also knowing from the nature of this vine that it can be raised with profit in your State, I would like to have you introduce the same. I am therefore willing to send you 100 cuttings of this vine for \$1, or 1,000 cuttings for \$3. If you should prefer rooted vines, I can let you have them for \$2 per 100, or 1,000 for \$18.

Hoping to hear from you soon, I remain,

Yours truly,

F. D. ROSENDAHL.

FORT SCOTT, KAS., May 11, 1891.

Hon. L. A. GOODMAN—DEAR SIR: An old patron of ours contemplates planting a pear orchard of forty acres on his lands situated about midway between here and Wichita. The land is high prairie, and what is known as mulatto soil, which we think quite preferable for pear. The orchard will be planted for mercantile purposes, and he wishes us to recommend the varieties most preferable to plant, and also the proper distance for planting. We think he contemplates planting nearly all dwarfs, and is inclined to favor late varieties. We feel

incompetent, as compared with you, to render such advice as he needs in this matter. We, therefore, apply to you for your opinion as to the proper distance to plant dwarfs separately, or whether you would recommend mixing some standards with them; also the varieties, from your own experience and observation, which would render the greatest returns.

If you will favor us in this matter, we will try to reciprocate whenever the opportunity offers.

Very respectfully,

HART PIONEER NURSERIES.

The following questions were read:

BARRY, MO.

Query 1: To set an apple orchard (commercial) of 500 or 1,000 trees, what varieties, and how many of each? Location, upland of Clay county.

Query 2: To set 500 to 1,000 pear-trees for a commercial orchard, what varieties, and how many of each of Standard? What varieties, and how many of each of Dwarf? Location same.

Query 3: What proportion of each, Standard and Dwarf, in 500? What in 1,000?

Query 4: For one or more acres of plums, what varieties? How many to an acre? What proportion of each?

Suggestion: That action be taken to secure the transportation of small fruits by rail by the case, instead of weight, on reduced or special rates, as is milk, no matter whether shipper has one or 50 cases. Cheap fruits are as important to health and comfort as cheap milk.

Why should a 10-gallon can of milk (80 to 90 pounds) be carried 10, 20, 50 miles (and can returned) at 10 to 15 cents, and a case of berries (40 to 50 pounds) be charged 100-pound rates (cases not returned), say 16, 18 to 25 or 30 cents per 100 pounds? If only one case, 25 cents, the minimum rate for a bill, no matter how small the weight.

Remarks: We have many suggestions as to fruits and varieties which succeed in choice locations, but as everybody do not and cannot have the best, and consequently cannot make an "intelligent selection of site," nor have our astute friend from Bates to assist in "selection," would it not be well to suggest what fruits and the varieties may be grown on inferior and indifferent sites?

Fruits of some kind grow in almost any situation, and people live on almost all kinds of sites; poor people, who need fruit as much as those more fortunately situated, usually have sites poorly adapted to

choice fruits or best varieties; why not suggest such as may be grown for the good of the poor, "whom ye have always with you," as well as those that shall be most profitable to the professional fruit-grower? Is profit the highest aim of this Society? Or is the health, happiness and good of mankind its primary purpose?

There is fruit "beyond the river" much more valuable and precious than all we can grow in our orchards, vineyards and berry patches, and we may enjoy its sweet ambrosia here by promoting the health and happiness of the poor in their struggle in life.

DAN. CARPENTER.

The meeting has been such a success that I wrote the following letter to the President of the Pettis county society:

WESTPORT, Mo., Dec. 21, '91.

Mr. G. B. LAMM, President Pettis County Horticultural Society:

Since my return from the meeting, and in thinking over the whole of the matter of our pleasant sojourn at Sedalia for a few days, I am more delighted than ever over the result of the thirty-fourth annual meeting. I think that your society deserves a great deal of credit for the successful planning and carrying out the whole of your program, and helping every delegate to enjoy himself hugely.

About one hundred and twenty-five delegates were present, and you well know how much looking after it takes to get them acquainted.

The attendance by your towns-people was an agreeable surprise in the interest they manifested in our work and in the number and quality of attendance. There was nothing to mar the meeting during the whole session, and every one went away pleased. The thanks of the Society are certainly due the county court for the very pleasant rooms in which our meetings were held; to the musicians who so kindly gave us such splendid music; to the hotels which gave us reduced rates, and especially to your society for their untiring efforts to make all feel at home. We never did have quite such nice rooms to meet in, or such hotels to feed and lodge us, and you will allow me to congratulate you on your success.

Our program was full indeed, so full that we only used about one-half our papers, but the discussions were profitable, more so, perhaps, than so many papers, and as the papers will go into our report, we will all get the value of them there, but not of the discussions on them, which oftentimes is the better part.

I regret that we did not have the time to take up the discussion of the orchard question as completely as we required.

I find that one-half of the value of these meetings comes from social and personal discussion of the topics with individuals, so that the fact that we are lodged together at one or two hotels is of great value to each member. It is not what you and I hear from the papers or the discussions, but the personal acquaintances we form, and the answers to personal and practical questions we ask and hear from each other, that the most benefit accrues. If we could all be at one hotel it would be a pleasant and profitable feature of our meetings.

It will hardly do for me to tell you of all the pleasant features of the meeting, but I must mention one or two others for the benefit of others who invite us to their city.

The committee who met us at the depot and told us where to go, the committee of introduction, whose business it was to make everyone acquainted with everyone else, the committee on reports, who saw that a report of our meeting went, not only into our daily papers, but into our farm papers also, all did their duties well. I must speak a good word for the daily papers of your city also.

Horticulture is becoming such a prominent feature in our State that our papers and our people are seeing that wonderful results will be accomplished in this work, and are assisting it in every way.

I shall, and the Society will, always remember this as one of the most pleasant meetings of our Society.

Respectfully,

L. A. GOODMAN, Secretary.

The following reports were made :

MOUND CITY HORTICULTURAL SOCIETY.

The society has a full set of officers in good working order. There has been a large amount of fruit-trees planted in the north and north-west part of Holt county this last spring—larger than ever planted in one year before since the county was settled. The prospect of the fruit crop was never better, except budded peaches. The Amsden June has the best showing of any of the budded ones. Seedling trees are very full of peaches.

C. SHULTS.

MOARK HORTICULTURAL SOCIETY.

THAYER, MO., Dec. 1, 1891.

The Moark Horticultural society was organized in March of the present year by a half-dozen citizens of Missouri and Arkansas inter-

ested in horticulture, under the name of Fulton County Horticultural society. By hard work and a considerable amount of drumming, our membership increased slowly, but surely, until now we have forty members, all hopeful as to the outcome of our labors. In August we found we had as many or more members in Missouri than in Arkansas, and with but little opposition the name of our society was changed to "The Moark Horticultural Society," of Thayer, Mo., and Mammoth Springs, Ark.

Great credit is due to President D. S. Helvern for his untiring energy, and to our treasurer, P. P. B. Hynson, editor of *The Monitor* at Mammoth Springs, for his good work in publishing weekly from a half column to two columns of horticultural matter. In this way he has done the society more good than any other one man. Our labors have not been in vain, for many are now ready to plant what they can with their limited means. While we cannot as yet boast of as many thousand barrels of fruit shipped from our section as from some of our older contemporaries, yet we are proud to say that our section of the country has produced the finest fruit in size, quality and color in America, and we are sure to get there in quantity as soon as our country is developed.

We invite you all to come and see us, especially in the fruiting season, and partake of our luscious strawberries and raspberries; our large, fine flavored peaches and pears; our big apples, and lastly, but not least, bring a few thousand with you and join in the multitude to develop the finest fruit country on earth.

S. W. GILBERT.

REPORT ON ORCHARDS.

The past season, in many respects, has not been all that could be desired, on account of the severe drouth from July to September. Occasional small showers, however, kept our trees, with few exceptions, in a fairly good condition.

Our apple trees have made a fair growth and are generally in good condition.

Our peaches have made a fair growth, and in my own orchard I notice that there are fewer fruit-buds on many trees than there were a year ago. Probably some of our experts can tell us whether the lack of buds is due to drouth or to spraying; I, myself, am sure that I can show trees that are seriously affected from an over-dose of Paris green they received last spring. I hope, however, to avoid this unpleasant-

ness in future by not using over one pound of poison to 400 gallons of water with a little lime added, and adhering strictly to directions published by our Experiment station.

Raspberries and strawberries are in good condition for a heavy crop next year.

Yours very truly,
S. W. GILBERT.

LIVINGSTON COUNTY HORTICULTURAL SOCIETY.

CAVENDISH, Mo., Nov. 21, 1891.

MR. L. A. GOODMAN—DEAR SIR: In response to your invitation, I will send you a report from our county (Livingston.) Our county society is increasing in numbers, but not as fast as we had hoped; we number 40 now; it is hard to get some of the leading fruit-growers to take hold and help us. We have had seven good meetings the past year, and we had a fine display of fruit at the county fair. A good many large orchards have been set the past season, and a large proportion of the trees have lived, but a good many trees have made a small growth on account of the trees not being sufficiently cultivated. A great many are getting more careful about protecting their trees from the mice and rabbits, by putting screen wire, split corn-stalks, brown paper and other things around their trees.

There is a lamentable lack of horticultural knowledge among fruit-growers, which is plainly evident in riding over the country; the ground is allowed to grow up to weeds around young trees, and if they live, they only make a growth of a few inches, when if they were properly cultivated, they would have grown at least two feet. Old orchards are allowed to be in grass until the trees are dead or dying; in a great many cases nothing is done to keep up the fertility of the soil, and the trees starve to death in consequence. In many cases the trees are allowed to be swayed about by the wind, and many of the roots are broken, the trees stunted and leaning badly. They are allowed to grow until the tops are too thick and heavy, and then an overdose of trimming injures them badly. Many have too many other things to do to attend to their orchards properly.

The apple crop did not turn out as well this year as last. Two shippers at Chillicothe shipped 26,000 barrels; they shipped some apples that were not grown in the county, but there were several other shippers in other parts of the county; so I think the above amount will be about what was shipped, besides what was used here, evaporated, made into cider, etc. Most of the apples were sold at \$1 to \$1.20 per barrel.

There was a very good supply of small fruit for home use, but I did not hear of any being shipped. Peaches were a short crop.

Spraying has not been done to any great extent yet, though encouraging reports come from most of those who have practiced it. The codling moth was worse this year than last, and so was the scab; borers were more plentiful also.

We need a good cider-mill in our county; there are nothing but hand-mills in use, and thousands of bushels of cider apples go to waste. We need a good cold storage, to keep our apples here till they are worth more than they are in the fall.

We will hold meetings of our Society in different parts of the county this winter, and try and get up more of an interest in horticulture.

I should like very much to be present at the meeting in Sedalia, but sickness in my family will prevent my going.

Respectfully yours,

M. L. BROOKS, Cavendish, Mo.

BARRY COUNTY,

In the southwest part of the State—Arkansas on the south, McDonald county west, joining the Indian territory.

The land is high and rolling, some parts breaking into small mountains, with numerous fertile valleys, with streams of clear, running water, fed by springs. Many of these streams afford the best water-power known.

About nine-tenths is covered with timber and shrubs of nearly all known varieties of this country. This abundant timber and stone afford our citizens cheap material of which to construct their buildings and fencing.

The soil will compare with the average of the State. The valley has a deep gravel loam, which produces good crops of all kinds of grain. The hill lands are more varied; the portion facing the north is a rich gravel loam, with occasionally spots of stone; the portion facing the south is not so rich, has more clay and stone; the summits, or flat portions, have all the qualities of the hill-sides, with a fine clay, clear of stone or gravel, especially where post-oak is found growing; also, on the prairie. These uplands produce fair crops of grain and grass; with a crop of clover turned will produce equal to the valleys.

This high land is specially adapted to fruit, which is now being planted very rapidly. Apples, of nearly every variety, grow here; only a few varieties are profitable. Ben Davis stands at the head as a commercial apple. Peaches do well here; we have had four crops in the last five years.

Pears are uncertain after one or two crops ; they usually blight and die. The Keiffer is now being planted in preference to any others. A large orchard has been planted, and shows no signs of blight yet ; bore a crop last year on the poorest land we have ; cost \$2 or \$3 per acre. Some claim that poor land is what is wanted to make a success with pears.

Plums are at home in any of our soils, and do well—four crops in last five years. Wild Goose stands head. German Prune does fairly well ; regular, but not heavy. I do not know of any Japanese varieties bearing yet.

Berries of all kinds have been grown here with good success ; quality and quantity No. 1.

To those wishing to engage in fruit-growing, we believe there are advantages in climate and soil worthy of your notice. Also, lands can be bought (now), unimproved, from one to five miles of depot, at from \$5 on to \$10 per acre ; improved, \$10 to \$25. I would advise every person to come and see before moving, as book and paper descriptions always look fair, and the writer is certain to give the brightest side at all times.

G. G. JAMES,

Delegate from Barry county, Mo.

Letters of appreciation and of thanks for the recognition of their services were received from Sam Miller, of Bluffton, Prof. M. G. Kern, of St. Louis, Hermann Jaeger, of Neosho, Miss Mary E. Murtfeldt, of Kirkwood, and John Burr, of Leavenworth, Kansas, for the honor conferred upon them in electing them honorary members of the State Society.

L. A. GOODMAN, Secretary.

HOW TO GROW A PEAR ORCHARD IN EAST MISSOURI.

By R. J. BAGBY, New Haven.

Owing to the very brief time I have to command from other business, I shall endeavor only to tell how to "How to grow the pear in Eastern Missouri," so far as my experience and observation goes.

The soil is all very well adapted for a good growth of wood and for good crops of fruit, our only material enemy being blight. To avoid this in commercial orchards, would advise the planting only of

such varieties as Keiffer, Garber, Duchess, Seckel, etc., and add in smaller proportions Bartlett, Anjou and Flemish Beauty.

The preparation of the soil for an orchard should be thorough, deep-plowed and subsoiled. Buy two-year-old trees, or one-year-old whips if you prefer, but will assume that your preference will be for two-year, well-headed stock. Of course they should be propagated on whole pear stocks. Plant about the same depth, or an inch deeper than they stood in the nursery, and cut the branches back to within six or eight inches of the body, and allow the trees to make practically a new head. The distance apart, we think, for planting the varieties named, would be twenty feet each way. The orchard should be well cultivated the first three or four years, after which it can be kept in clover or orchard grass.

There is nothing better for the pear than a good mulching of stable or barn-yard manure, applied during the winter. This should not be neglected. The first few years after the orchard is planted, such varieties as Keiffer, LeConte and Garber are inclined to be very much like the Lombardy Poplar. It is well the second year after planting to cut back the growth enough to make the trees more stocky. A wash of a pound of soap, dissolved to a gallon of water, is excellent to keep the bark in a healthy condition, and should be applied to the bodies from the branches down to the ground, early in May and later in June. Assuming that you plant your trees propagated on pear roots, with full roots, smooth bodies and healthy stock, we know of no tree on which an orchardist can look with more pride than a thrifty-growing pear orchard, with its strong, vigorous habit of growth and dark-green foliage.

For an orchard for home purpose, where the fruit is intended for family use, other varieties should be included to cover the entire fruiting season; but as I am not familiar enough with the standard assorted lists, will not undertake to suggest a collection for home purposes, but for the commercial orchard would plant most all Keiffer, Garber and Duchess. The Keiffer, like the Ben Davis, has been much abused, but those who know it will continue to plant it. The complaints that we hear regarding this variety are that "it never ripens," "not fit to eat when it does ripen," and others similar. Let me say in answer: allow them to mature on the tree before you gather them, then allow them to ripen before you attempt to eat them. They will ripen as showy as any California variety, with rich, golden coloring, and the flavor, while perhaps not equal to Bartlett, will not disappoint you in the least. A well-matured, well-ripened Keiffer should please the palate of any one. The Duchess will make strong orchard trees, and will make the

bushels and money to the grower, and we consider it the profitable variety of its season. It lacks the rich coloring of the Keiffer, but can be marketed earlier. The same can be said of the Garber, which is the most vigorous grower of any variety that we have planted. The writer would like to have the experience, as far as a more extended list of varieties goes, from such growers as Mr. Dierks, of Jefferson City, who we understand has an orchard of over 5,000 pear trees, and also from Mr. H. J. Weber, who is familiar with all the standard varieties. We think that a pear orchard of the varieties named for commercial purposes, well attended to, will bring the owner ample returns for all money and labor expended.

We have the fullest confidence in the pear for Eastern Missouri. In the future years we shall probably be able to add several other varieties to the list which is now known as profitable varieties for market, but at the present time it would be well to confine ourselves to such sorts as are the least susceptible to blight. Although I have noticed large trees, some of them almost a foot in diameter, in the Missouri river bottom, of such varieties as Bartlett, Congress and others, could hardly advise extensive planting of them, owing to their liability to blight. We believe that more pear trees are being planted here in the last few years than have been planted in all time previous, as it is now nothing unusual for parties to plant pear orchards.

PEARS.

An essay by GEO. P. LUCKHARDT, Oregon, Mo.

[Read before the Holt County Horticultural society at its last meeting.]

Agreeably to your request, I take the pleasure to give you another year of my experience in pear culture.

This has perhaps been the most encouraging year for the last thirty years. When the time of spring arrived, and the sun with its beneficent rays had commanded the dreary winter and its mantle of snow to retire for another season, nature put on its beautiful garment in a more than usual splendor. Flowers sprang up in the gardens, by the roadside, under the hedges; grass, herbs and weeds took possession of every imaginable spot, but the glory of all nature was shown in the glowing bloom of the fruit-trees. They seemed to have put forth an especial effort to make the horticulturist's heart to rejoice, and may we not believe that others rejoiced with us, and gave thanks to that

merciful Creator from whom all blessings flow, and who has poured out treasures to this part of the world with such a bountiful hand. While Europe and other countries are now looking starvation in the face, our barns and store-houses are filled, the railroads can not put on cars sufficient to move the immense crop of wheat, and it will take a great many cars yet to move the Missouri fruit.

But to return to my subject. The pear trees opened up with such an amount of vigorous bloom that the leaves were perfectly out of sight, and it seemed as if nearly every bloom had set with young pears. The frequent rains and the cool weather prevented the insects from doing much harm to the fruit, and consequently a large amount of pears grew to perfection, less infected with mould spots or specks and moth stings than I ever saw before.

To be not too lengthy with this report, I will give you a statement of my crop of perfect pears gathered this year. From two Doyenne Boussoe I gathered a little over six barrels; from two Beurre D'Anjou, five barrels; from two Dwarf Tyson, one and three-fourths barrels (you remember that the Tyson is a small pear, and that it takes a great many pears to fill a barrel); from a small Standard Beurre Superfine, one barrel, and the Dwarf Beurre Superfine were nearly equal. The Sheldons gave me four barrels, but I am sorry to say that the trees are passing away. Now these trees were all planted twenty-five years ago. The two Beurre D'Anjou Standard and the two Dwarf Tyson had hardly a blighted leaf on them this year. The Doyenne Boussoe and Beurre Superfine had only a few small twigs blighted; one Standard Sheldon had also very little blight, but the others are nearly gone.

To sum up the whole crop of pears, which would not have covered one-fourth of an acre of ground, they have realized me clear of all expenses, \$62.25, even at the unprecedented low price of \$1 per bushel. I am very well satisfied with this result, even if you are not; but if you can tell me of any other crop with which I can make more money, I shall be very much obliged to you if you will tell me what it is, and although I am sixty-five years old, I promise you that I will see to it that the crop is put in.

Please allow me to mention a thought which occurred to me during this summer. In going through the orchard and looking at the wonderful crop of pears, I said: Now see here, you fellows; you fellows have been standing here for a quarter of a century; I have hardly done you any good during all these years, even not cut the weeds and the grass to give you a good mulching, and now you come again and make my very heart rejoice; but I said, well, I am going to do it right now. I went up town (not to get a drink of whisky), but to engage a man to

haul me some good manure, as well rotted as he could find; this was thickly spread around the trees, so that they had a good mulching and food in which they can delight themselves. Speaking of manuring trees, I found two things which I never knew before: first, that feeding rootlets are nearer the stem of the tree than is generally believed; and secondly, that roots extend much further out than the accepted rule. In digging near a good-sized tree, this summer, I found a great many feeding rootlets within a foot of the stem, and at another I found very fine roots six feet further from the circumference of the top of the tree. Now, the rule is generally laid down that there are no feeding roots near the stem, and that the roots spread out as far as the circumference of the tree; both are mistakes, and if you want to manure your orchard spread it over the whole surface to make it effective.

I found a little trouble again this year as to the time of gathering pears. Some customers call for pears perfectly ripe. Now if you let the pears remain on the tree until they are soft, you will simply spoil the pears. They are not near as good as if you take them off just before getting soft, and then ripening them in a cool place. Again, pears ripened on the tree are too soft for canning or preserving, and as to shipping, that would be an impossibility; they would be all mashed before getting to their place of destination. The rule for gathering pears is first to notice when they begin to drop; these are mostly imperfect; but your time comes now to examine the pears; this you do by lifting the pear upward two or three inches; if the pear comes off at the enlargement of the stem which unites the pear to the twig, then your pears ought to be taken off and ripened in the house or cellar for eating; but if the stem breaks, the pears are not sufficiently ripe.

In conclusion, I would say that my opinion as to varieties worthy to plant, and given you last year, is confirmed by this year's experience. The Beurre D'Anjou I place far ahead of any other pear for general cultivation, both for general cultivation and quality of fruit.

Next the Tyson for exemption from blight; but the pear is small, yet a very good sweet pear; I notice that my customers call it the sugar pear.

Next I would place the Beurre Superfine for health of tree, and the pear is of good size; but if you are not very careful, and let it get a little too ripe, it will be rotten at the core.

Next Doyenne Boussoe; the tree will recover of the blight and do well for many years, and as to quality and size of fruit, there is hardly anything enough said to praise it.

Next Sheldon, large, excellent, profitable, but will blight when it gets older. However, I would not want to be without some Sheldon pear trees.

Next White Doyenne, the old Virgalene, as good as ever, but will blight some when getting old. Next Seckel.

My dwarf trees are doing very well yet, but the Standards are about all dead.

BIRDS IN HORTICULTURE.

By G. W. HOPKINS, Springfield.

"On the fourth day, God created the fowls of the air." According to the Mosaic account of creation, when man first made his advent into the world, the birds were there to welcome him. In imagination we can wander back to that beautiful garden which God adorned and beautified for the abode of our first parents, and see Adam and Eve as they sit under the trees and listen to the warblings of the feathered songsters, or watch them as they drink and bathe in the pebbly brook that flows by the tree of life.

Since that time long, weary centuries have passed away—races of men have perished from the face of the earth—great kingdoms and empires are known only in history; but the birds are still with us. We find them everywhere—in the valleys, along the hill-side, in the jungles and on the mountain tops. Sad and desolate; indeed, would this world be if the birds were not here. Who would care to go into the woods and look at the grand old monarchs of the forest, as their leaves are swayed by the gentle breezes, if the birds were not hopping from twig to twig and pouring forth their songs of joy and praise?

How refreshing it is to the watcher by the bedside of a sick friend through the long vigils of the night, to hear at early dawn the sweet melodies of the feathered songsters! How eagerly we watch, in early spring, for the return of our feathered friends, who have gone south to a more congenial clime during the cold winter months!

The robins, the blue-birds, the mocking-birds, and a host of others, come and go as regular as the seasons. Birds, if not molested, soon become quite tame. I never allow birds killed on my place if I can prevent it. The result is, that they are becoming quite numerous, and I consider them among my best friends. The blue-birds build every year under my back porch, and the wrens and sparrows pick the crumbs from near the door-step.

No horticulturist who has ever watched the movements of birds in their destruction of insects, but will admit that they are an important factor in the preservation of our fruits.

I have been watching a pair of blue-birds, this season, feed their young. From early dawn until dark the parent birds are coming in to the nest with bugs and worms at short intervals, and it is wonderful to see how much the little fellows will eat. It has been estimated that a single quail will destroy a bushel of insects in one season. The insects which prey upon fruit are rapidly increasing each year. The time was, in my boyhood days, when I could go to a peach or apple-tree and gather nice, sound fruit. But now we have to carefully inspect each specimen, or run the risk of biting a worm.

There is nothing in the whole cereal or vegetable kingdom but what is subject to their ravages.

I am one of those who believe that the time is coming when there will be a war for very existence between man and the insect creation, and man, unaided by his feathered allies, will stand but little show in the conflict. I believe that if to-day the birds were destroyed throughout the world, in less than five years gaunt famine would stalk abroad in the land, and the whole face of the earth would be as barren and desolate as the great Sahara desert.

It is true that some birds on the first appearance of fruit will eat a little, but I have ceased to begrudge them this little morsel, as I know that they pay me back at a high rate of interest in the service they render in destroying my enemies. "The laborer is worthy of his hire." I heard a man boasting this season of having killed twenty cat-birds which were eating some of his cherries.

Now the question is, would not the services of these birds in the destruction of injurious insects largely overbalance the loss of a few sour cherries? We think it would.

When I was a boy they used to plant long poles at the root of the old Morello cherry trees. These poles reached to the tops of the trees, and the wood-birds (who are very fond of cherries) would light on the top of the pole to take observations before entering the tree. A man or boy would slip to the pole and hit it with a maul or an ax, and down would come the poor bird with the breath knocked out of him, who lost not only his cherries, but his life. I indulged in this sport a few times, but soon became ashamed, and I am proud to know that from that day to this I have never wantonly destroyed an innocent bird or robbed their nests. If there is anything I do abhor and detest, it is the trifling loafers who swarm out from the cities and towns on every highway that leads to the country, and wage a war of extermination against everything in the shape of birds. Poor little innocent wrens

and sparrows, whose bodies are no larger than a hickory nut, fall a prey to these relentless butchers. Great big men come out in their buggies and slaughter the innocent dove, the lark, the robin, and return with their trophies, as proud as the Indian brave who has dangling at his belt the scalps of his murdered victims.

I never killed a dove in my life. I never see one but what my mind wanders back to the time of the flood, when old Father Noah sent out this bird from the ark and it returned with the olive branch, symbolic of peace and reconciliation.

The custom, indulged in by a large portion of the boys of our country, of robbing birds' nests and killing birds just for the sport, and to hear the noise of the gun, is one which cannot be too strongly condemned.

Parents should endeavor to impress upon the minds of their boys that it is not only wrong to engage in this slaughter of the innocents, but it is encouraging acts of cruelty which in after years may lead to serious trouble.

In this connection I desire to read a clipping from a newspaper which bears upon the subject:

I USED TO KILL BIRDS.

BY M. C. EDWARDS.

I used to kill birds in my boyhood,
Blue-birds and robins and wrens ;
I hunted them up in the mountains,
I hunted them down in the glens.
I never thought it was sinful—
I did it only for fun ;
And I had rare sport in the forest
With the wee little birds and my gun.

But one clear day in the spring-time
I spied a brown bird in a tree,
Merrily swinging and chirping,
As happy as bird could be,
And raising my gun in a twinkling,
I fired, and my aim was too true ;
For a moment the little thing fluttered,
Then off to the bushes it flew.

I followed it quickly and softly,
And there to my sorrow I found,
Right close to its nest full of young ones,
The little bird dead on the ground !
Poor birdies ! for food they were calling ;
But now they could never be fed,
For the kind mother-bird who had loved them
Was lying there bleeding and dead.

I picked up the bird in my anguish,
I stroked the wee motherly thing
That could nevermore feed its dear young ones,
Nor dart through the air on swift wing,
And I made a firm vow in that moment,
When my heart with such sorrow was stirred,
That never again in my lifetime
Would I shoot a poor innocent bird!

And now I approach a portion of my subject which I would gladly pass by in silence, but I think this paper would be incomplete without the reference.

Those who know me are aware of the fact that I have in my heart a warm and tender feeling for the feminine portion of creation. In this day of woman's rights, the ladies score us poor men unmercifully for our faults—and they don't give us half enough—and yet, we bear it meekly.

So I hope, if I indirectly hit at some of their fashions to-day, they will take it in all kindness.

I suppose you can guess by this time that I am hitting at the fashion of adorning bonnets with birds. Millions upon millions of our feathered friends are sacrificed yearly on the altar of fashion.

The great metropolis of the British empire uses alone for this purpose several millions of birds. I was reading but a short time ago where one firm in London had sent out an order for 600,000 birds. This same demand exists in all the leading cities of continental Europe and the United States, in proportion to their population.

How long at this rate will it take to exterminate the whole race of birds? Along the coast of Maine they have what is called the mackerel bird. What it is, I don't know; but some of you may have worn it on your bonnets. Some years ago this bird was very numerous, and very destructive to insects. The demand became so great that men in that locality abandoned other avocations, made the business a profession, and by every artifice known to man, lured the poor creatures on to death.

The result is, that this species has almost been swept from the face of the earth. And so it is with many other species in different parts of the world. Oh, woman, the noblest work of God's creation, so tender-hearted as to step aside to avoid crushing the worms that crawl upon the earth, pause and reflect before yielding to the caprice of fashion. Remember that the beautiful plumage which adorns your sister's bonnet may have been procured by the sacrifice of a whole nest of young birds.

Listen to the wail of those motherless ones who call in vain for that which will keep them from starvation and death. You certainly can be loving enough, pretty enough, and sweet enough, without purchasing it at such a sacrifice of innocence. I am glad to know that in England societies are being formed to discourage the practice.

In these societies are found ladies of the highest rank in the realm, including the queen's household, and even good old mother Vic is in full sympathy with the movement. And now, in conclusion, allow me to indulge the hope that the time is coming when men and boys will cease to destroy our feathered friends, and their sweet songs be heard from every roadside meadow, and forest.

HOW TO UTILIZE OUR FRUITS.

By WM. BRODBECK, Oregon.

You will see by the following list, given me by J. R. Linville, our processor, that we are prepared to utilize our fruits as far as the canning is concerned. Here it is, word for word, as he gave it to me:

"The tomatoes raised in Holt county, for the Oregon Canning Co., will compare very favorably with the tomato crop in any place that I have seen, both in this State, Iowa, Nebraska and Arkansas. The quality and flavor cannot be beaten, while the quantity far exceeds most localities, as a few of the farmers would have realized 500 bushels per acre had it not been for unfavorable circumstances in getting cans, which stopped them from delivering for nine days. While they all, or most all, delivered 300 bushels per acre, some did a great deal better—Cyrus Philbrick delivered 172 bushels from $\frac{1}{4}$ acre, Ben Harris 225 bushels from $\frac{1}{2}$ acre, W. H. Morris delivered 615 bushels from 2 acres, while a great many more did just as well; and had it not been for the lay-off in waiting for cans at the factory, they could easily have delivered 500 bushels per acre, which fully shows that the tomato crop will be as good a paying crop at 20 cents per bushel as the farmer with small farms can raise, while the factory gives employment to people of all ages, children and adults as well.

"While the work is mostly done by the piece, it gives all an equal chance. Girls the age of 12 and 14 years made from 50 to 75 cents per day; the women made from \$1 to \$1.25 per day. As this was the first year for the canning factory at this place, they only canned corn and tomatoes, which only gave them about three months' run. If they will can peas, beans and berries, and all other products this country

affords, they could easily run six months in the year, as the peas would come in about the middle of June and last till the middle of July, and the blackberries and raspberries would keep the factory in operation until sugar corn came in, and the tomatoes would follow corn, and apples would follow tomatoes and keep the factory running until Christmas or nearly so."

I can vouch for the above to be true, and we can see from the above list that if Cyrus Philbrick could have delivered tomatoes those nine days, in the heart of ripening, his fourth of an acre would have raised at least 200 bushels, which would be 800 bushels per acre; at 20 cents per bushel this would amount to \$160 per acre, and I don't believe they can beat this anywhere.

I must now turn to my subject, "The Fruits:" Wm. Terry raised 4,700 quarts of blackberries on one acre, on the bluffs near Forest City, Holt county, Mo., and netted \$200. Where is the country that can beat this—East, West, North or South? They can't beat it much, if any. Our blackberries generally have to go from Friday till Monday between pickings; then they are too ripe to ship. All such fruits should be canned or evaporated; then they can be shipped to the remotest parts of the earth, thus doing good by putting these healthy fruits in shape, so those who are beyond the reach of green fruits can get them.

This company paid for labor \$4,000 for a three months' run, and with a hydraulic press and evaporator would be prepared to make jelly and vinegar, thus using all the apples, even the peelings and cores, and thus giving six instead of three months' employment—making the amount for labor \$6,000 or \$8,000. This would be a good investment, and besides, would be a kindness that would be appreciated by those who have no other means of support. Even if the operators or producers did not make so much themselves, they would give employment to others and build up our town, as this money is all paid out in the immediate neighborhood of the town or any city where this work is done.

We are buying those canned goods and evaporated goods from the East, and in that way we are building up the eastern cities. No one can live in a town without some means of support, and they can't beat this country for raising fruits and vegetables, and by utilizing them we can make three or five times as much to the acre. Thus our large farms can be cut up in smaller tracts, giving room for more people, and thus raise that which will treble or more to the acre, and farm better, and not run over so much ground, and yet make more money.

I have used the Oregon canned goods, and to my taste they are far superior to any canned in the eastern states, and I have heard many say the same, and that they could not be better. I would therefore suggest to those dealing in canned goods to buy of Steele & Walker, of St. Joseph, Mo., the Oregon brand of tomatoes and sugar-corn, and if it is equal to eastern goods, then why not buy home manufacture and build up our western towns and cities by giving employment to our own folks? And by paying as much for our home manufacture as we do for the eastern, I think this work could be done here with a profit to the operator.

I visited the factory frequently while in operation. I saw that great care was taken that no impure or unwholesome material went in the cans; all was handled and examined by hand before it was canned. Mr. Linville, our processer, is fully master of the business.

I have it from good authority that New York makes millions of dollars by evaporated fruits, and even millions out of peelings and cores. Then why not utilize and save all our fruits?

ROSWELL G. HERR'S WORDS.

[There is so much of the western spirit in the following address of Roswell G. Herr at a celebration of the "New York Tribune" anniversary, that I append it in full.—SECRETARY.]

The chairman next introduced Roswell G. Herr, of Michigan, who had assigned to him as a text Horace Greeley's famous saying, "Go west, young man!" Mr. McElroy said, in presenting Mr. Herr to the audience:

"There is probably no saying outside of Solomon which is better known than Mr. Greeley's 'Go west, young man.' It is the subject that has been assigned this evening to a distinguished Republican who is well able to handle it. Born in Vermont, he took Mr. Greeley's advice, went to live in Michigan, was sent to Congress from Michigan. I have the great pleasure of introducing to you the Hon. Roswell G. Herr."

Mr. Herr, who was cordially received, said:

Mr. Chairman: If you will take a strip running around the world, bounded on the south by the 20th degree of north latitude and on the north by the 60th degree of north latitude, you will find that this belt of the world's surface, which comprises not to exceed one quarter of its area, really covers the home of nearly all the great human achievements of the past centuries. Within this narrow belt will be found the

cradle of the human race. It covers the Garden of Eden, Jerusalem, Smyrna, and the great valley of the Nile. It not only embraces all there was of ancient Egypt, but within these lines are Persia, Carthage, Greece, the Roman empire, France, Spain, Germany, the bulk of the Russian empire, Great Britain, all of the United States of America, also Japan and the Chinese empire.

If you will stand on the banks of the Euphrates, which is given as one of the boundary lines of Eden, and is somewhere near the spot where the human race is said to have gotten its first start in this world, and look toward the east, you will find an unbroken area of land stretching out over 3,000 miles, while the distance toward the west from Jerusalem to the Atlantic ocean is hardly one-half that number of miles.

The first emigrant mentioned in the written history of the human family is said to have left the country of his birth at an early day. His name was Cain, and his record tells us that he moved east, not west. Whether he went simply in search of a wife, or whether he had learned that there was no extradition treaty between Eden and the land of Nod, is not clearly set forth, but it is distinctly stated that he traveled to the east of Eden. His example of moving in the wrong direction, however, does not seem to have been generally followed.

There must have been, even at that early day, some Horace Greeley familiar with the Aryan language who went up and down the highways and byways along the banks of the Euphrates, shouting to the passers-by, "Go west, young man." We know this, because we soon find cities and empires springing up in the west.

First came the long line of Egyptain rulers from Rameses I to Nebuchadnezzar, and with them the people who founded Babylon and built the Pyramids. They were men who had just moved west. Nebuchadnezzar must have been a western man, for you remember he was on a ranch for seven years of his reign. Then followed Carthage, the home of Hannibal, and Greece and the Roman empire. You see, Romulus and Remus were simply two young men moving west. They founded an empire, laid out a city and no doubt did a thriving western business in the sale of corner lots. Then followed the ancient Gauls, the Franks, the Tentons, and last of all Great Britain, the furthest west of them all, made up of the people from the east who were striving to get nearer the setting sun. For a time the Atlantic ocean seemed to place an impassable barrier in the way of this human impulse to get further west.

It is now almost 400 years since Columbus crossed that ocean and again made it possible for the human family to obey what had now become a congenital trait—an inherited desire to go west.

There can be little doubt that Columbus, too, received his first inspiration from some Horace Greeley of the Middle ages, who, governed by the impulse that had been accumulating through the centuries, and perhaps having been taught a lesson from the disasters of the Crusaders, who you know had always been attempting to move east, stood in the streets of Genoa and traveled up and down the valleys of Spain, shouting with the religious fervor of those days, "Go west, young man." Columbus simply went west, and in doing so discovered the New World, the Western hemisphere. Thus again it was made possible for the live, active portion of the human family to move on in the direction that had always blessed the race. What we now call the East was then the West. The New England and Middle states were all settled by people who were going west.

The Pilgrim fathers, the Dutch who took possession of New Amsterdam, where we are to-night, the Quakers who came into Pennsylvania, the men who founded Delaware and Maryland, were all emigrants from the east going west. They had no sooner filled up these New England and Middle states, which we call the East now, so that people began to jostle against each other a little, than there appeared on the scene a man born among the mountains of New Hampshire, but located in this metropolis of the New World, who again, seized with the impulse of past ages, animated by the inspiration of the old prophets of Judea, his soul on fire with the same enthusiasm that once directed the vision of the young sailor of Genoa, started again the winning cry for the movement of the human race, "Go West, young man." This seer of the New World was Horace Greeley; his mouth-piece was the paper whose semi-centennial anniversary we celebrate here to-night—The New York Tribune.

The people of this nation and many from the Old World acted upon his advice. From that day down to the present time they have been constantly going west. It is certainly permitted to me to speak somewhat of that West here to-night.

THE MAGNITUDE OF THE WEST.

Few people realize the magnitude of that great empire. You may take all the New England and Middle states, comprising Massachusetts, Maine, Vermont and New Hampshire, Connecticut and Rhode Island, New York and Pennsylvania, New Jersey, Delaware and Maryland, and they contain only about 247,000 square miles. The entire South, giving them Missouri, Arizona, New Mexico and the Indian territory, have 1,000,000 square miles. The West covers 1,800,000 square miles of ter-

ritory. Do you know that into the six new states just admitted into the Union, you can place the six New England states eight times, and then have land enough left to make the State of Delaware? There is land enough in these six states to cover the entire thirteen original states that first comprised this Government, and then have enough left to make three states the size of New York, and still edgings enough to make a state as large as New Jersey and Maryland combined.

But, you ask, are not those six states mostly mountains! By no means. There is one valley in the State of Montana that will take in the entire State of Massachusetts without its touching the mountains on either side, and several more into which you could tuck away the State of Rhode Island and the space would hardly be missed. Indeed, in my judgment, there are more acres of good, arable land in those six new states than there are in the thirteen original states of this Union. And then think of Ohio, Michigan, Indiana, Illinois, Wisconsin, Iowa, Minnesota, Nebraska, Kansas, Oregon and California still left for farms, and the mines of Colorado and Nevada. So much for size.

But what does this great West produce? Let me enumerate. Nearly all our wheat; the bulk of our corn, most of our oats; a large part of our beef and pork and mutton; the greater portion of our wool and hides; much the larger part of our poultry and eggs, and butter and cheese; almost all of the gold and silver and lead and zinc; about all of our copper; one-half of all our iron ore; most of the lumber, and soft coal without any limit. To move all these products is no small problem. Do you know that the tonnage which passes through the Sault canal each year is once and a half as much again as the entire amount that passes through the Suez canal, which receives the freight from two hemispheres? There are more tons of freight that go through the Detroit river each year than enters the great shipping port of Liverpool, that wonder of the east. But those two arteries hardly touch the carrying power of the West. There are to-day in the United States about 167,000 miles of railroads. Of these New England and the middle States, the East, have 26,000 miles; the South has 51,000 miles, and the West has 90,000 miles. The three States, Ohio, Illinois and Iowa, have more miles of railroad than the eleven New England and Middle States.

What then, you ask, is left for the East to produce? what does she do? Evidently a great work. She manufactures, very largely, the materials from the South and West for our entire people; makes the larger part of the leather, the cotton goods, the woolen goods, the silk goods, the clothing, the boots and shoes; manufactures every conceivable kind of fabric; converts the ore of the West into iron and steel,

again into rails and nails and wire, and all kinds of machinery and tools; and utilizes our copper and zinc and lead; absorbs most of our gold and silver; takes mortgages on our farms, our city property, our railroads and mines, and cuts the coupons off from most of our bonds.

Yes, some one says, we know about the wonderful products of the West, but you have omitted the greatest product of the East. She also grows men, wonderful men. (Applause.) I know that in the past her efforts in that direction have been greatly blessed. One can hardly say enough in praise of a country that has such a list of great names. No land need feel humiliated that can count among its historians such men as Prescott and Bancroft; in literature such names as Washington Irving, Nathaniel Hawthorne and Ralph Waldo Emerson; among its poets, Longfellow and Bryant and Whittier; as theologians, Jonathan Edwards, Channing and Lyman Beecher; among its financiers, Robert Morris and Gallatin and Fessenden. One need look little further for statesmen after naming Alexander Hamilton and Daniel Webster, and there is little room left for others in journalism after two such names as Benjamin Franklin and Horace Greeley. (Applause.)

THE HOME OF BRAVE MEN.

Yet, did it never occur to you that when the Lord, looking into the future, saw trouble ahead for this Republic—saw that he must have men of action, men who would have the faculty of doing things, to meet the trying necessities of the coming conflict, he turned his eyes toward the West, and planted Sheridan and Sherman and Grant and Stanton and Lincoln, all of them, in the new, undeveloped West? (Applause.) Such men must needs have been placed where there would be room for them to grow. Where else would it have been possible to rear such a man as Abraham Lincoln? Call him frivolous if you will. Cast at him gibes and taunts on account of his awkward person and lack of polished manners. Never mind all that. The world will write him down as possessing two qualifications that are very essential in the make-up of a great man. He had heart and brains. Given these two essentials in such a marked degree, and small defects count for little.

There are two men, both reared in the West, whose places are already assured in the history of the human race—Grant and Lincoln. They will both hold their positions through the ages—Grant as the one man who completely filled the bill, who did the work assigned him, and did it well, even if it did take all summer; and Lincoln, who had the intellect to grasp the entire situation and the heart to keep always kind and gentle and considerate, never lagging in his love of freedom, and never losing sight of the union of all the States and the perpetuity of

the Nation. Had the West simply given to the world these two men, her cup of great achievement would be well-nigh full. (Applause.)

In naming the great men of the East, I confined myself mostly to those that are dead and gone; not because she has not now living many men of renown—giants, too—but because to give the list here in this presence to-night I fear would shock the well-known modesty of too many of our guests, who so dislike to see their names in public print. If there is anything in which a Western man exhibits almost religious zeal, it is in his reverence for such girlish shrinking from public notoriety. I know the merits of these men, but must respect their delicate sensitiveness.

In the West you seldom find this peculiar self-abnegation so strongly developed. Lack of "cheek" is rarely mentioned as a Western weakness. Her people usually know what they want and proceed at once to claim it. How else could they have secured the World's Fair for 1892-93, for which the contest was so sharp and severe? Having secured the location, there need be no alarm about her making it a success. Just now she seems to be moving a little slow, but presently you will see her bestir herself. Then watch out for lively work and big results. To half do anything is not a Western trait.

Among the people of the West may always be found a broad sympathy for those in distress, and a keen sense of appreciation for all things really meritorious. Indeed, so many of the best men of the East followed the advice of Horace Greeley and went West, that no one can tell when facing an audience in the West whether he is in the presence of people born in New England, New York or Iowa.

But, some one says, is not the West the home of wild schemers, anarchists and lawless gangs? She may raise a good deal of grain, may feed a good many hogs and cattle, may have a long mileage of railroads, but within her borders are found the flat money cranks, the socialists, and she has produced such a city as Chicago.

My answer is: The West hanged the anarchists. Her visionary men will soon come to their senses, and Chicago will take care of herself. It seems to me hardly becoming in New York, or Boston, or Philadelphia, to sneer at Chicago. They have the growth of 200 years to make them what they are. Though not a very old man, I was in Chicago when it was a mere village; afterward saw square miles of her burnt district; left there two days ago, and say what you will, she is a wonderful city, the product of the wonderful West. Of course, the West is not without her faults. Her people may need more culture, a loftier standard of political ethics; they perhaps lack reverence for poetry and the fine arts. Are you people of the East perfect? Where

can you find a worse-governed city than can be named among those bordering on the Atlantic ocean? In the East you sometimes have small-pox and cholera, and you are never entirely free from the Muggumps. Tell me, if you can, why "the heart of such a people should always be proud?"

THERE IS PLENTY OF ROOM STILL.

You ask, is not the West now full? is it not time to stop repeating this talismanic sentence of Horace Greeley? Far from it. The West has just began to grow. You can put the entire population of the United States into the States of Illinois, Missouri, Iowa, Minnesota and Dakota, and they will not be as thickly populated as is Great Britain to-day. More than that, with proper cultivation these states can furnish food for the whole 63,000,000 people. The possibilities of the West for the production of food have as yet been hardly conceived. The valley of the Mississippi alone will some day be swarming with 600,000,000 human beings. There is nowhere else on the face of the earth such a tract of productive land. Its future is beyond all calculation, almost beyond comprehension.

Horace Greeley realized somewhat of these treasures. He was always in sympathy with the men who tilled the soil. His vision never tired of watching the farmers of the great West. His words in those days, in "The Weekly Tribune," reached nearly all their homes. No other man did so much to people that country with live Eastern men, or had so much to do with shaping their beliefs and molding their character.

THE HARDY FLOWER-GARDEN.

Suitable for the Country Home and City Lawn as well.

PHIL. PFEIFFER, Sedalia.

To beautify our lawns with trees, shrubs and plants, I would recommend to select, in the first place, hardy plants suitable to our climate to establish a permanent growth, which will eventually produce fine specimens of different kinds and varieties of trees and plants, thus increasing in beauty as well as value, and giving, therefore, as time and care finish the plantation as a whole, the greatest satisfaction to the lover of a cheerful home.

Of ornamental or shade-trees I place the Ash, the Silver, Sugar and Norway Maple, the Elm, Tulip tree, the hardy Catalpa, the Linden and Sycamore at the head of the list. The Green and Mountain Ash, the White Birch, the Cypress and Maiden Hair may be planted where a more open lawn is desired.

Of evergreens, for beauty, the Norway Spruce, the White Pine, the different Arbor Vitæ, and the new Japan Arbor Vitæ, head the long list. The Scotch Pine and Red Cedar are easily transplanted, hardy, of quick growth, stand snow and sleet well, and can be recommended where an effective shelter is wanted. The Irish Juniper, with its pyramidal form and bright green foliage the year round, deserves a place in every lawn, and is especially suited to ornament the cemetery lots.

Of flowering shrubs the species and varieties are so numerous that most any taste can be pleased, and I will mention some of them alphabetically, with a short description of their merits:

The Althea grows upright, shapely, and with its abundance of foliage and large double flowers is growing in popularity, and deserves it fully. The lovely double pink rose and white flowering variety is, when loaded with its numerous buds, a sight of beauty when the rays of the morning sun expand their flower petals.

The Barberry, especially "Thunberg's Japan," and the purple-leaved, are both rich in foliage and color and effective in shape.

The Calycanthus should not be missed, as its large flowers furnish us with that fragrant and spicy strawberry scent not found in any other plant.

The *Cydonia Japonica*, or Japan Quince, with its bright, glossy foliage, its hardy constitution, rapid growth and inclination to form a beautiful roundly-shaped bush, producing, with the resurrection of nature's life in the spring, the bright, rose-like flowers underneath its green foliage, should certainly not be overlooked in the lawn, neither in the city nor country home.

The many varieties of the *Deutzia* are among the earliest to produce their glossy dense foliage, and their pretty numerous flowers, double and single, pure white, pink and rose. The *Deutzia flora plena alba*, with its long racemes of pinkish-white flowers, seen from a short distance, surpasses any shrub in beauty and loveliness for the eye to rest upon.

The *Eunonymus* (Strawberry tree), of slender growth, bright green foliage, becomes, when fall and frost calls vegetation to rest, with its scarlet berries, a pleasing ornament in the bare lawn amongst some handsome evergreens.

The *Forsythia* (Golden Bell), with its upright slender limbs, bright green foliage, is about our earliest flowering shrub, and its bright golden-yellow flowers, covering it before the foliage comes out, are a lovely sight so early in the season.

The *Hydrangea grandiflora* is doubtless one of our prettiest shrubs. It is perfectly hardy, of quick growth, nice full shape, and just in mid-summer, when many of our shrubs have filled their mission, the immense pyramidal panicles of pure white flowers are a grand sight indeed. It blooms until fall, and the color of the lovely large bloom changes to pink, rose and purple. This shrub is very showy, and is to be recommended for cemetery planting.

Ligustrum (or California Privet), single as a specimen, or in a row to make a hedge, there is not a more desirable nearly evergreen shrub in our great list of foliage plants. Its pyramidal upright growth, glossy green dense foliage that hangs on until Christmas comes, must be loved. It produces neat white "Lily of the Valley" like flowers in June.

Philadelphus (or Mock Orange), of upright and strong growth, glossy green foliage, is extremely hardy. Its sweet blossoms filling the air with fragrance, are a welcome spring flower at the time of Decoration day, and are produced in great numbers.

The great variety of the *Spirea* family is too well known to need much praise. They make well-proportioned shrubs; are all hardy and grow easy; blooming from May until September, in varied forms and colors; pure white, rose and pink, single and double. The double white or Bridal Wreath, with its long slender limbs, glossy small leaves, the *Callosa*, with its lovely rose-colored flowers, and the Golden *Spirea*, a robust, tall-growing shrub, with distinct yellow foliage, are of the best. No lawn should be without some of them.

The *Syringa* (Lilac) is a luxurious, large-growing, hardy shrub, with healthy, glossy green foliage and lilac, purple or white, very fragrant flowers in early spring. These lovely, sweet blossoms are very useful as cut flowers.

The *African Tamari*, with its lovely small pink flowers, sown like pearls along its straight, like a fine evergreen, looking branches, should, after blooming time, be cut back to form new limbs for the next season's bloom.

Viburnum (or Snow-ball), a popular, hardy, robust-growing and freely-flowering shrub. Its early, handsome, pure white flowers cover the whole plant and last a long time, and if it is not an aristocrat it will always be grand and valuable.

Weigelia, a large-growing, well-shaped shrub, with large, green foliage and finely formed tubular flowers. These showy and valuable

shrubs furnish us in most delicate tints—cream colored, pure white, pink, rose and crimson—good sized clusters of bloom from June until September, and they are well worth a prominent place in the finest lawn.

Of deciduous vines and creepers that are hardy, of healthy growth and therefore suitable to plant for shade or ornament, let me mention:

The *Ampelopsis* (Virginia Creeper), with its beautiful, rich green foliage, that turns into a brilliant, crimson color toward fall. Its tendrils cling to almost anything they touch, and are therefore very useful for covering unsightly objects or adorning church walls and towers as a fit substitute for the English ivy, which does not stand our climate. The *Ampelopsis Veitchii*, of Japan, is still more able to cling even to glass by its rootlets, and by its smaller, numerous glossy leaves, it covers the smoothest walls perfectly, turning to a beautiful crimson in autumn.

The Pipe Vine (or Dutchman's Pipe) is a very fast-growing vine, with large, roundish, light-green leaves. It is a great bloomer, and its tubular, large flowers are of a distinct yellow-brownish color. Its hardiness and vigor, as well as its large foliage of flowers, recommend it as a running vine for shade and beauty.

The *Clematis* family deservedly earns the prominent place it holds amongst climbers. The American varieties and some of Japan are all hardy. Their quick growth and dense shape recommend them, especially to cover light, neat structures, for shade or ornament, and the little, sweet flowers of *Clematis placenta* fill the traveler's heart with joy.

But for brilliancy of colors nothing can surpass the flower of the large flowering *Clematis*; from pure white rose, blue and purple, single and double, they bloom from June till fall. It is indeed a grand sight to see a good-sized and well-kept *Clematis Jackmannii* in full bloom, the large purple flowers covering the plant completely.

Perhaps there is no climber more popular than the Honeysuckle. It is, in its three distinct varieties, the red or coral, the yellowish white or Japan, and the red and yellow flowering or Belgian, everything considered, perhaps our most valuable climbing plant. Its quick, dense growth, hardiness, glossy foliage, and its numerous sweet flowers—blooming from spring till fall—may be ranked for usefulness in flower work with many of our delicate boquet flowers. It has many friends, and will always be a favorite running vine.

The Chinese blue *Wisteria*, such a rank, strong grower, hardy and lasting, with its large clusters of pale blue pendulous flowers, its thrifty foliage, is admirably adapted for plenty of shade.

Last, but not least, the Running Rose must be mentioned. The queen of flowers hardly needs any praise; it is too well known. Why then should we miss it in our lawns, either in the form of a shrub or as a climber? They are so numerous in varieties that everybody can be pleased. As good, hardy and well-blooming climbing roses, the Queen of the Prairie, large, pink and full; the Baltimore Belle, double white; the Seven Sisters, blooming in clusters, the different flowers varying in color from white to deep rose; the Russel's Cottage, a profuse bloomer, dark crimson, and the Madam Goodrich, or running Jacqueminot, are the best of the list. They grow fast, and if well trimmed and trained will flower abundantly and for a long time.

In conclusion, let me state that the short description given of the plants mentioned in this paper is true and not overdrawn, and that any of them is suitable to our climate, and if properly selected, planted and grown, will always give satisfaction.

YOUNG PEOPLE ON THE FARM.

By Miss LINDSEY, Springfield.

When I read in the program that this subject had been assigned to me, I thought for once the committee had given me a theme that I knew all about. I first saw the light of day on a farm, and the first twenty years of my life were passed in the same delightful place. How well I remember the log cabin, with its big fire-place, where we used to burn great logs two feet thick and four feet long!—a regular old-fashioned Whittier fire, with its back-log, fore-stick, top-log and middle-stick, and some chips underneath to start it up.

And the old clock, that had welcomed in steady measure every new-comer to the family—that had ticked the solemn requiem of the dead, and kept company with the faithful watchers at the bedside during many long hours of patient waiting!

And there were the big, restful beds, with their soft, downy pillows; and father's old desk, that was always an object of interest and curiosity to us children.

And the old family Bible, thumbed with the fingers of hands long since still, and wet with the tears of eyes long since closed, holding the simple annals of the family and the heart and the conscience of the home!

I do sincerely believe that, all things considered, young people can have more fun to the square inch on a farm than anywhere else. At least we did.

There was a large family of us, both boys and girls, and most of the neighbors' families were of a like generous number, so there was no lack of company. Of course, we had to work, for farm life and work go hand-in-hand. But even on a farm work is not all of life, as we had abundant opportunities of proving. After supper, and the dishes washed—sometimes, I confess, with a lick and a promise—we girls donned our best calicos and brightest ribbons, and the boys their biled shirts and paper collars, and were away to singing-school, where the music, though not always artistic, was cheerful and loud—especially if two sopranos were trying to captivate the same boy. The altos were a little more modest—I was an alto; we considered soft, sweet tones more effectual. But the walk home was the best part, for brothers and sisters got badly mixed up about that time. A moonlight walk, with interesting company, of even a mile or two was not thought much of a hardship. But we did not always walk; when the roads were muddy the boys came around with their big, strong horses and took the girls behind them. Then the rule was reversed, for of course we had to hold tight to keep from falling off as we went galloping over the prairies and through the brush, up hill and down.

When winter came, oh, then we had fun. The boys would hitch four horses to the big bob-sled, place a wagon-bed on it and fill it with hay. Then what a scramble for the back seat—all young people and some old ones well understand why. Of course there is danger of a young lady falling out at the back of a wagon.

But of all the good times that young people can have on a farm, sugar-making is the sweetest and best. Father always had a lot of elder bushes growing on his farm, and during the winter evenings he cut them into lengths of about twelve or fifteen inches, and punched out the pith, making what he called spiles. I don't know why they called them that, but they always did—I suppose because they were round. When the warm days came in February, and the sap began to flow, the men-folks would chop a place in the side of each tree and bore a hole and drive in a spile; then place a trough under it to catch the sugar water. The troughs were made by sawing a log about eighteen inches thick into lengths of twenty-four or thirty inches, splitting them in two and cutting out the center of each piece, making two troughs.

This work was usually done by the hired man in the winter when it was too cold to work at anything else. When the troughs were full,

they took a little sled or boat, placed a large barrel on it, hitched one horse to it, and drove to each tree, and with a big gourd dipped the water into a bucket and poured it into the barrel, and when full, drove to the furnace. The furnace was composed of a platform holding five or six big iron kettles, with a place underneath for fire.

When the sap was boiled down until it was very thick, it was carried to the house. When mother stirred it off was the harvest time for the little folks. They had all the taffy and 'lasses they wanted then, and the toothache afterward. The young folks had their fun in the evening, when they would all collect at one place and do their own stirring-off.

Talk about candy-pullings! the little tame affairs they have nowadays are as a candle to the moon in comparison to those we had. For I must say, for pure and unalloyed fun and jollity, give me an old-fashioned candy-pulling—out in the sugar-camp of a bright moonlight night, and a big kettle of syrup, surrounded by twenty-five or thirty young people, each one with a plate greased with butter, impatiently waiting for it to get thick enough to pull. We always tried it by dropping some into a cup of cold water. When it made stiff wax it was ready. When each person was supplied with a plateful of wax, and the pulling commenced, everyone within a radius of two miles knew they were having a candy-pull over at Deacon Smith's.

Oh, the snatching, pulling and throwing candy ropes over one another's necks, the laughing and screaming! how those old woods, hills and dales echoed and re-echoed with our joyous merriment. Of all the bright pictures that hang on memory's wall, those moonlight candy-pullings are the sweetest and best. May the fair vision ever remain to cheer me through the dull routine of my busy life.

This subject, like all others, has two sides, for it is an undeniable fact there are better opportunities for literary culture in town, and church privileges are better. We read whole chapters from people who live in town, advising young people to stay on the farm, but it is no use; they won't do it. And with such bright examples before them as the sainted Lincoln and the gifted Garfield, who can blame them if they do leave the quiet routine of farm life for the more stirring marts of trade?

And then it is not always John or Betsy's fault if they do go to town; for there is nothing so attractive to the young people in town as to go out to Uncle John's and have a grand old time. And it is not always the rosy-cheeked apples that are the attraction; often-times there are other cheeks equally rosy. And of course John junior must

be polite to the judge's handsome daughter when she rides out with her stately father, and stops to taste farmer Blank's cider and sample Aunt Polly's mince pies.

Judging by the congressional directory and the early history of the prominent business men and women of the nation, I would say, if all the boys and girls that had been reared on a farm staid there, I don't know what would become of the nation. About nine-tenths of the persons who have made themselves felt in the business circles of the country were born and brought up on a farm. Therefore I would say to the boys and girls, be contented and happy; do your work well and faithfully; have all the fun you can; romp and play and lay up a good stock of health, and if, on reaching maturity, papa is able to give you a farm, settle down on it and make an honest living; if not, go to town with all your fresh young life and energy, and let the city dude go to the country and see how he likes tilling the soil. Perhaps contact with Mother Earth will have a strengthening effect on his brain as well as muscle.

Senex Smith says we must tone up rural life in this country. We country folks must stand up for our rights; we must claim our place as the true aristocracy of the land. We belong to the first family. Adam began life as a gardener, but soon became a farmer. Eve did her own housework. The modern idea that farm labor is degrading is a relic of the dark ages. We must make the young people believe that labor is respectable; that it is just as genteel to cook a good dinner as to paint a good picture; that a college graduate does not degrade himself by riding on a gang-plow or running a separator. The hand hardened by honest toil is that of the true man. In this way only can we make country life respectable, and our children contented and happy.

LESSONS OF THE YEAR.

By C. TEUBNER, Lexington.

In working out the task assigned to me by our worthy Secretary, I have added the lessons of past years to those of the present. A single experience or lesson may be misleading, but when the same lesson is repeatedly observed, it can be accepted as a fact, and to such only shall I confine myself.

Lesson 1—Drouth, I have found, is a prime factor in the winter-killing of trees and plants. Many of these are injured or even killed during some winters, but mostly when the winter was preceded by a dry season, and the injury is greater if the drouth occurs at fruiting time. Yet the same degree of cold would not prove injurious if preceded by a season of sufficient moisture. The tenderness of some kinds of fruit is often due to this cause. Drouth weakens them, and they then fall an easy prey to cold.

Well-nourished trees, like well-fed cattle, are able to stand a much greater degree of cold than those which are half starved. No doubt the sap in a tree, like blood in an animal, aids in resisting the injurious effects of a freeze. While convinced of this years ago, the past year has most emphatically confirmed this lesson. Our firm has eight acres in raspberries, composed of Gregg, Cuthbert, Mammoth Cluster, Tyler, Centennial, Turner, Crimson Beauty and Schaffer's Colossal. After the bulk of the crop of our early varieties was gathered, and as we were starting on the late ones, a severe drouth occurred, lasting over two weeks, the thermometer ranging for ten days at 100 or more degrees, and in consequence much of the fruit dried up on the vines. We had given them clean culture and the vines had made a fine growth, yet early in December the late varieties, Gregg, Cuthbert and Mammoth Cluster, showed signs of injury, which increased during winter; and although they were headed back severely, the crop on these this season was very light, hardly paying expenses, while the early kinds gave a full crop, on the same kind of soil and with the same culture.

This year we had another severe drouth, but late in the season, from August 21 to end of September, and I fear that many plants and trees will be injured or killed during the winter, as nearly all the varieties mentioned show some signs of injury.

Lesson 2—The placing of a heavy mulch about peach-trees after the ground is frozen, in order to retard the bloom, is a fallacy. The placing of corn-fodder around the trees and limbs for the same purpose is another mistake, so long as the upper limbs or the ends of them are exposed to the sun. Even though a part of the roots, say a foot below the surface, are encased by frozen earth, the sap will circulate if the limbs or part of them are exposed to the warming influence of the sun or atmosphere. This is shown by the sugar and other maples. While the ground is still frozen, or thawing and freezing, February's sun starts the circulation in their rigid bodies, and from every wound the sweet sap flows copiously. Another example I once saw, was an outdoor vine trained through a small opening into a warm room where it leaved out, while the roots outside were clasped in winter's icy embrace.

Lesson 3—Apples, to keep well, should not be allowed to hang too long before gathering; such varieties as the Jonathan, Ben. Davis, Rome Beauty and some others should be gathered as soon as they have attained full size and color, and commence to drop; but they should not be put into a cellar (unless it is a very cool one) until cold weather sets in. Place in barrels and store in a cool shed first, because the average cellar is too warm until the earth becomes cool.

The keeping of an apple may not only be prolonged by timely gathering, but its juiciness and quality preserved, or even improved. Ben. Davis, if so gathered, will remain juicy a long time, and be of very fair eating quality; but if left on the trees too long, it will soon become mealy and insipid, in fact, scarcely fit to eat. If those growers who consider the Ben. Davis such a very poor apple in quality will gather them early and keep them cool, they will find that it is much better than its reputation.

This fall has been exceptionally dry and warm, consequently apples ripened up so much on the trees that they will not keep well. Some of the long keepers are fit to eat now.

Lesson 4—In order to preserve the mealiness and flavor of potatoes, they should be dug as soon as the vines are dead. Several seasons' experience has convinced me of this. Those dug early one wet season remained smooth, firm, and cooked mealy, with full flavor, while a third of those remaining in the ground rotted, and the balance—dug late—had a rough skin, were eaten into by grubs and mice, and cooked watery and insipid. They should also be kept in a shed until there is danger from frost. We have kept forty bushels in one of our berry sheds during a warm August and September, and lost no more than a peck. This year many of the late dug potatoes made a second growth, and very few of our home-grown potatoes are as they should be.

Lesson 5—Nature straightens crooked trees. This, while not to be taken in its full literal sense, is in the main correct. The growth of shade-trees on the sidewalks of our towns and cities furnishes ample proof of this. You may see crooked trees planted every year, yet in twelve to twenty years they are almost uniformly straight in body. Nature tends to fill vacancies, hence the concave side of a crooked tree out-grows, proportionately at least, the convex side. Let a large limb be broken off by a storm, and in a few years the gap is closed and the symmetry of the tree restored. This applies, though in a less degree, to fruit trees. Less, because of the weakening effect of heavy crops and insufficient nourishment. I have frequently planted out unsalable trees for myself, and saw them grow up into beautiful specimens, with but little assistance in pruning. They were well nourished, however.

Many customers of nurseries are unnecessarily exacting as to symmetrical growth in the choice of their trees. An ill-shaped tree, well cared for, soon changes its original shape for the better, and in the course of ten to fifteen years but little difference can be noticed in the shape of trees of the same variety, though there may have been a marked difference when planted. It is natural for us to admire symmetrical trees, and they are the best to plant; but almost any tree can be made to come near perfection with care.

Lesson 6—It does not pay to let unprofitable trees cumber the ground. Barren trees, or those of which the fruit is deficient in size, unsuitable in time of ripening, or too poor in quality to be profitable for either market or home use, should be grubbed out and replaced by better varieties (or if it is done right, they can be regrafted). Those on a decline or badly injured should also come out, even if of a good variety. Land and time are too valuable to waste on worthless trees.

Lesson 7—This will round out the lessons with a chapter on rabbits, who are such an inveterate enemy of the tree-planter and nurseryman alike. To keep them out of our nursery we found the shotgun remedy of little avail, and it wasn't that we missed them too often either. So we made eleven box traps, and during the last winter caught enough to make our tally marks run over one hundred. Not a dollar's worth of trees were injured, but without the traps, hundreds of trees would have been ruined.

THE TRIALS OF AN APPLE PACKER.

By HENRY SPEER, Butler, Mo.

Mr. President and Members of the State Horticultural Society :

I do not, in the short paper which I present, expect to tell you how apples should be packed. That has been done repeatedly in the reports of this Society. But I will call your attention to a few of the difficulties a Missouri apple packer and shipper has to contend with.

I will start out by saying that the proper place to pack apples is in the orchard in which they grew. Yet how many of our Missouri orchards are large enough to justify a packer in taking his barrels and hands to the orchard to pack them? And where there is enough to justify this course, how often will he find shed room for his barrels, either before or after packing? Those of you who have handled wet barrels, either before or after filling, can appreciate the situation when

one of our fall rains sets in. Warped heads and staves and bursted hoops and a look of general dilapidation is the result. Add to this the fact that the grower is continually growling because his cull piles are so large, and because you will not take all his worthless apples, and you have one of the trials of a packer.

On the other hand, the packer opens a house at a shipping station and buys apples from the farmers' wagons. Mr. A drives up with a full load of nice Ben Davis, well sorted at home, and driven carefully, with a good cover of old carpet or something similar spread over them to keep off sun and dust and prevent bouncing on the road. You pay him a good fair price and unload him in short order.

Mr. B drives up with a few Ben Davis at one end of the wagon, some Winesap in the middle, and a lot of Jennetts at the other, big and little, sound and unsound, all mixed together; and then because you don't pay him as much for his apples as you did Mr. A, and took several hours to unload him, and then left him a good part of his load as mixed culls, he calls you a cheat, disputes your measure, and makes himself specially disagreeable. Or Mr. C drives up with a load of very nice-looking apples, and boasts that he has the nicest and best apples he has seen this season, all hand-picked and well handled; but when you come to take them out and find that three-fourths of them are so bruised, either by rough handling or on the road, that they are practically worthless, you begin to think that all is vanity and vexation of spirit.

I venture the assertion that three-fourths of the apples shipped from Missouri are bought by the bushel from farmers' wagons, and the conditions here presented meet the packer and shipper all along the line through the season. Now what is the remedy for this? I answer, larger orchards confined to a few market varieties, with suitable sheds and buildings to store the barrels and apples out of the weather; and when the apples go to town, let them go into the car for shipment without the extra expense of storage and handling the second time.

And why should not the grower pack his own apples, and either ship them himself or sell to the shipper ready for shipment? He can do this work at home cheaper than the shipper can come there and do it. But he must do his work right; do honest packing, mark his stock just what it is, and so take away the reproach which you will find in all our markets against what they are pleased to term "farmer-packed stock."

Then the question of price comes to the front. The seller insists that you are not paying enough. Why, he says, brother John has just got back from Texas, and apples are worth \$1.50 a bushel down there.

You write or wire the Texas dealer, offering him apples at \$2 per barrel, and he tells you that you are too high; he would like to handle your fruit, but he can buy in Kansas at \$1.50. If the packer can meet the competition in buying and selling, and stand the innumerable losses, great and small, which meet him at every turn, and still have a fair margin of profit left, he is indeed fortunate.

Another source of trial and tribulation is the deceptive market reports which are spread broadcast over the country. When the market is good they fly thick and fast, and usually from 25 cents to \$1 per barrel too high. Minneapolis has taken the cake in this respect this season. I plead guilty to a certain degree of dullness, but it would take a much smarter man than myself to tell what any car-load of apples would bring on any of our markets according to the reports.

Another trial one apple-packer has had is, the business has been so exacting that he failed to get to the meeting till the last day in the morning.

HOW TO TREAT OUR OLD ORCHARDS.

By J. KIRCHGRABER, Springfield.

Mr. President, Members of Greene County Horticultural Society:

The above subject having been assigned to me by the Executive committee for a paper on "How to Treat our Old Orchards," I will in the following lines try to enumerate a few points. The question is often asked and often answered. Some say if your orchard is old and unprofitable, cut it down and plant new; while that recommendation would hold good in many cases, there are a great many old orchards all over the country that could be improved and brought up to a reasonable productiveness and even profit; therefore don't be too hasty about cutting down; it takes a number of years to get another orchard.

Many a farm that was once profitable has been worn out (so-called) through one cause or another, but generally from neglect and too much greediness or ignorance. It is only the law of nature that if you take year after year from the soil crops without giving something back to your soil, slowly but surely it gets exhausted in the principal chemical elements, and finally fails to produce any satisfactory results, and the farm is worn out, worthless and abandoned, so to speak, until some one with the proper understanding takes hold, and by judicious manage-

ment makes it blossom and yield good crops. So with our old orchards, it is exactly the same: a tree cannot go on bearing and be profitable year after year under such a robbing system.

An orchard (that means generally apple) seems to get old in the Western states quicker than in the East. All over New York and the New England states can be found apple orchards seventy-five and even one hundred years old, and still producing fine fruits. And why? Simply for the care bestowed on the orchards. Now what can be done in the East could also be accomplished in the West.

Now, how to treat an old orchard: The first requisite to success is a willing determination on the part of the owner to lay hold and do it. Where trees had been badly neglected (which they generally are), a sharp ax, good saw and a ladder are the most necessary tools. Now cut out all brushy and surplus limbs (if limbs of any size are to be cut off), paint the wound over with paint to prevent decay, cut out all crossing branches, and thin your trees in the center to admit sunlight and air, shorten some of the branches in so as to make the tree evenly balanced in top, leave some of the best healthy young shoots or water-sprouts to make bearing wood in time; a good scraping off of the old, rough bark is also of some benefit.

After having cleared the ground of all brush, then at the proper time plow slightly, or as best you can without injuring the trees or tearing the roots, break up the old sod, give the whole orchard a good harrowing. Now haul as much good manure as you can get, spread it evenly all over the orchard, and keep cultivating the ground as often as you can during the summer. To keep the soil loose, use a harrow. Keep your orchard free from weeds, and your labor will certainly be rewarded in due time with good fruit. Unleached wood ashes are also a splendid manure for old orchards; but good stable manure, at the rate of twenty to thirty loads per acre, is better. Don't be afraid of overdoing it.

An orchard treated as above outlined will soon come into good health and profitable condition; but bear in mind you must not expect to take and not to give. Clover can be sowed the second year after breaking up, and hogs turned into your orchard will "take care of it." While it is sadly true there are many orchards almost beyond redemption, yet the experiment is worth trying, and you may have a reasonable crop from your old orchard until your young trees are planted and in bearing condition. Spare the old orchards, and take care of them.

OUTLOOK FOR ORCHARDING: OR, PROFESSIONAL FRUIT-GROWING.

Paper read by R. E. BAILEY, Fulton, Mo., before the Farmers' Institute Nov. 11, 1891.

I have been asked to write a paper upon the outlook of the orchardist or professional fruit-grower, to be read before this meeting. I am only a beginner, but will give you the results of my brief experience, supplemented by what I have read and heard from other fruit-growers. Of course I can not treat the subject exhaustively. That would require a volume, even were I able to write it. I will endeavor to give you a few hints and outlines to place the subject before you.

Agriculture will be followed as long as men require food and women need clothing. Horticulture is only a branch of agriculture—one of the higher branches, I think. As men grow more civilized and refined, I believe they will become less and less consumers of flesh and other animal products, and more and more of fruits and vegetables. Indeed it is conceivable that the world may become so densely populated that there will be no room for the lower animals at all. Under the best culture now known (how much better it may be in the future no one knows), one acre will produce enough food to support at least ten persons continuously. If the population of the world increases in the future as it has in the past, the time will come when your 160-acre farm will have to produce enough food for 1,600 people. Where will the hog be then? When this stage is reached, man will be a vegetarian from necessity, if not from choice.

But enough of this speculation. Let us consider a few reasons why the outlook for fruit-growing is favorable, and will continue to grow more so as the years roll by. That the present is more favorable than past times easily within the memory of those present, no one will deny.

1. The consumption of fruit seems to be increasing faster than the supply. I know this is the case in our local market, and from the conversation of old people I learn that fruit formerly sold for much lower prices than it does now, and even at low prices much of it lay and rotted upon the ground or was consumed by hogs, or worse still, was made into cider and drunk by human beings whom it would not be polite to call swine. Some fruit even now may be wasted in various ways, but not for lack of demand. I venture to say that 90 per cent of the children of this town are now hungry for apples. The same would be true of adults were not so many tastes depraved by the

use of tobacco, beer, whisky, tea, coffee and other poisonous stuffs called foods, drinks or medicines.

2. The outlook for the professional grower is better, for the reason that diseases, blights, insects and pests of various kinds have so increased that the ordinary mixed farming no longer produces, in many cases, its home supply. How many farmers' families, even in Callaway county, have all the apples and canned fruits in their cellars now that they could use this winter, and this was a very abundant season for all fruit except apples. When the country was first settled the pioneer planted his trees, and they grew and bore fruit with little after care; not so now. Thousands of dollars are thrown away every year by men who try to do as their fathers before them did. I do not believe that one tree in ten that are planted ever grows to bearing size at all; and the one that does survive lingers along at a poor, dying rate, bearing poor, sickly, tough, wormy fruit, instead of the large, plump, fragrant, juicy apple, tempting to a saint, to say nothing of the common small boy.

3. Our location is favorable. The great Northwest is at our doors. It has a climate too severe for fruit-growing, and we can abundantly supply them if we improve our natural advantages.

Missouri, northern Arkansas, a small part of southern Iowa, one-half of Kansas and a small part of Nebraska is the great apple section between the Mississippi and the Rocky mountains. If we will grow good shipping fruit and distribute it at moderate prices, we need not fear over-production.

In Callaway we are now just at a point where with a full crop we have a little too much for the home market and not enough to bring outside buyers. Increase the supply and the buyers will come.

4. Past experience proves that good orcharding has paid. The apples shipped from this State in 1890 were sold for not less than \$10,000,000. The crop on many farms in the western part of the State sold for more than the farms themselves would have brought the year before. I am only a beginner. In 1880 I planted a small orchard of Ben Davis that has already produced over \$250 worth of fruit to the acre, an average of over \$20 per acre per year, including the five years of waiting. In no single year have these trees had as good culture as an ordinary crop of corn. Three years they were not touched at all. I believe it would be very easy to double such yields. This year these trees made \$70 per acre. My greatest mistake was in not planting 100 acres instead of 100 trees. My second mistake was in cultivating \$5 oats, \$7 hay, and \$9 corn and wheat, and letting mice, rabbits and weeds care for my orchards. We now have 1,000 trees, and are giving them but little better treatment than the 100 received.

I will now name a few of the

CONDITIONS OF SUCCESS.

1. *Land*.—Almost all lands in the county are more or less adapted to fruit culture. Our wetter prairie soils are perhaps least promising, but if well drained even they will produce fruit in plenty. In a general way, I will say that rich, dry, timbered upland is best suited to orcharding. Many of our creek and river bottom lands, somewhat sandy, are very fine fruit lands—the only unfavorable condition being their greater liability to late spring frosts. Any land that will produce a good crop of wheat is good for fruit. Most of our white-oak land is fine fruit land. The trees do not grow as large on this as on richer black land, but they bear young, and abundantly of finer colored fruit. If every acre in this county that has been cleared and planted in tobacco had been planted in good winter apples and properly cared for, I have not the least doubt that they would have yielded their owners ten-fold the income of the tobacco.

2. *Thoroughness*.—To succeed in any calling, a man must give it his attention. A farmer is not likely to succeed in fruit-growing if he makes it secondary to ordinary farm crops and stock; but I do believe that with suitable land, a love for the business, a desire to learn, and patience to wait for his reward, he can do better for himself, his family, his country, mentally, morally, physically and financially, at fruit-growing than at any of the ordinary branches of farming.

3. He must have faith in his business and not feel that it is in any way mean, trivial or inferior to the very highest branches of industry.

In this community the fruit-grower is looked upon by many as an inferior kind of being, harmless, and perhaps even useful in a small way. They would think him presumptuous should he consider himself the equal of the man with his broad acres of corn, cattle, hogs and mules. If you believe that pork is more necessary for yourself and your family than fruit, you will not be likely to succeed at fruit-growing.

4. He must patiently wait for his reward who would grow fruit. He cannot plant to-day and gather to-morrow. Indeed, the fact that the orchard will not begin to pay for five years is one of the best guarantees that the business will continue to pay. But few men will wait so long, and many who begin will faint and fall by the way. If you could plant an orchard this year and gather a crop from it next year worth fifty or one hundred dollars per acre, the business would be overdone and prices would fall below the profit mark.

5. The successful fruit-grower must be a man of push, energy and business. He cannot drift along in the currents of time. He

must lead and not follow. He must keep himself informed of the supply and demand, and not only of his own vicinity but of the whole.

Some fruit-growers in the state last year lost thousands of dollars by saving one dollar, the price of the Rural World for one year. Some of them sold their fruit in the orchard early in the season for one-tenth of what its market value proved to be at picking time.

I will now state some of the difficulties or drawbacks, the enemies we have to fight.

1. Rabbits are fond of both the fruit and the trees, and it will be necessary to protect the trees against them in some way. Paper or wire gauze affords a mechanical guard against them. Blood or other animal matter rubbed upon the trees will keep them away.

2. The codling moth has become such a serious pest that it must be fought if we would have sound, salable fruit. This insect lays its egg in the blossom end of the apple soon after it blooms, and can be poisoned by spraying the trees, when the apples are about the size of peas, with Paris green, London purple, or white arsenic in water. It is not an expensive process, but must be done promptly at the right time. The pump, hose and other fixtures can be bought for \$10.

3. Borers can to a great extent be prevented by washes of lime, sulphur, carbolic acid, or soft soap. The wire gauze is successfully used for this purpose. D. A. Robnett, of Boone county, uses it for both rabbits and borers.

VARIETIES.

Small fruits come quickly, and pay if you are convenient to a market. But the apple is the safest market fruit, and pays better for the time and investment than the small fruits. Strawberries 250, apples 70. What variety of apples shall we plant for profit? This is perhaps the most difficult question the fruit-grower has to meet. Upon the proper selection of kinds suitable to the grower's climate, soil and market to a great extent depends his success. As a general statement for this locality, I would say that the Ben Davis is the best paying kind that I know, but I hope to find a better. We all know it is not of high quality, but it is very productive, bears young, is handsome. I don't know how soon buyers will pay twice as much for Genets, four times as much for Vandevors, and ten times as much for Belle flowers as for Ben Davis. Next to Ben Davis, Willow Twig and Jonathan are perhaps more grown in this State than other kinds. Jonathan is fall or early winter. The Willow Twig keeps better than the Ben Davis. They are both much better than that kind.

I think well of the Stark from a short trial—eight years; it seems to be very thrifty, hardy, and productive of fine fruit.

[Written for Smith's Small Fruit Farmer.]

BOTANY AS RELATED TO HORTICULTURE.

BY DR. ALBERT NEWMAN.

Botany is the science which treats of the vegetable kingdom. The domain of this kingdom is coextensive with the surface of the earth. From the equator far into the arctic regions it adorns the earth with its covering of beauty and loveliness, presenting to the eye an endless variety of form, color and size. Such variations are never abrupt, but pass from one to the other by such easy gradations that the uniform resemblances are many, while the differences are equally constant and marked. No one can fail to notice the resemblances of the red and white clover, or of the apple tree and the pear tree, and their differences are not less marked. We are never in danger of confounding them.

These resemblances and differences furnish a rational basis for the grouping of individual plants into species, including all such as have a common origin; of species into genera embracing such species as have more points of resemblance than of difference; and again, of genera into orders. By such grouping a system of law and order is seen to run through the whole vegetable kingdom. Its field is the world. Thriving best in fertile soils, warmed by the sun and moistened by the rain, it sometimes exists in quite unlooked-for locations—as bare rocks, in dark caverns in the bed of the ocean, and on the boundless snow-fields of the arctic regions.

The reindeer lichen of Lapland is said to grow in vast quantities among the almost perpetual snows; and a minute vegetable of the Algae tribe grows upon the snow far into the arctic region, often reddening the snow for miles around. But these have no especial interest for the horticulturist of this latitude. He is more particularly interested in such fruit-producing plants as thrive in temperate regions. It will therefore be my aim to limit what I have to say chiefly to such natural orders and species as may profitably be cultivated by the horticulturist of Kansas.

Botany in its broadest sense is not limited to the nomenclature and classification of plants. It includes a knowledge not only of their structure and habits, but also of their uses and relations to man. The animal kingdom is largely dependent on the vegetable for sustenance. Although the ultimate chemical elements of the animal body abound in

the mineral kingdom, no animal can appropriate a single one of these elements to the nourishment of its own tissues. They must first be combined and elaborated by the process of vegetable growth, so that man in common with all animals is directly or indirectly wholly dependent on the vegetable kingdom for his sustenance. "The king himself is served by the field." But were this the sole purpose of the vegetable kingdom, it would be exceedingly limited. The number of species which contribute to this end is comparatively small. A single natural order, the Gramineæ, furnishes much the largest part of the sustenance both of man and beast. Of its nearly 4,000 species, but a single one (*Lolium Temulentum*—Poisonous Darnel) has poisonous or even suspicious qualities. They are found capable of adapting themselves to all latitudes in which vegetable growths are possible. But with this family of plants the horticulturist is not directly interested. It concerns more directly the general farmer. The natural order with which the horticulturist is most directly interested is the Rosaceæ. As the natural order Gramineæ contains much the largest and most important part of the plants which the farmer cultivates, so this order contains much the largest and most important part of the plants with which the fruit-grower is directly interested. Unlike the farmer's order, this order abounds in a wealth of floral beauty. Even those species which yield the most valuable fruits, as the apple, peach and quince, present in their blossoming period an exhibition of beauty and fragrance well calculated to lift the heart in adoration of the wisdom and goodness of the Creator, who in contributing to our material wants has not been unmindful of those higher and nobler tastes which he has implanted in the soul.

If it were proper to distinguish between the useful and the beautiful, we might say that this order is noted not more for the quantity and variety of its delicious fruits than for the beauty and fragrance of its flowers. But if it be true that beauty has its uses, and that the beautiful is useful simply by reason of its beauty, then we might say that one of the most important ways in which this order contributes to the happiness and enjoyment of man is by the gratification of his esthetic nature. This order, containing about one thousand species, has very few that are unwholesome. Of its nearly one hundred genera, we find that eight include nearly all the species of this order which are of interest to the fruit-grower of this latitude. Of these eight genera, the genus *Tyrus* (pear) ranks first in importance with us. It includes the apple (*P. malus*) the pear (*P. communis*) and the crab-apple (*P. coronaria*). The genus *Persica*, a native of Persia, from which it derives its name, furnishes us with the peach (*P. vulgaris*) and the nectarine (*P. lavis*).

The genus *Armeniaca*, named also for its native country, Armenia, furnishes the apricot (*A. vulgaris*). The genus *Cydonia*, named from a town in Crete, from which it was brought furnishes the quince (*C. vulgaris*). The genus *Prunus* furnishes the plum (*P. domestica*), the cultivated varieties of which reach into the hundreds. The genus *Cerasus* furnishes the cherry, of which two species are cultivated—the Duke or English cherry (*C. avium*) and the Morello (*C. vulgaris*). Each of these species is represented by a large number of varieties. The genus *Rubus* furnishes the blackberry (*R. villosus*) and the raspberry, of which two species are cultivated—the red raspberry (*R. idæus*) and the black raspberry (*R. occidentalis*). And last but not least, the genus *Fragaria*, whose very name is fragrant, furnishes the delicious and fragrant strawberry.

There remain two important fruits for which we must look to other and different orders—the grape, belonging to the natural order Vitaceæ, of which it is the only important production. Largely cultivated in most temperate climates from an early age, there have been developed a large number of varieties. Vines from the seed, it is said, will bear fruit the fourth or fifth year.

The natural order Grossulaceæ consists of a single genus (*Ribes*), which furnishes the currant and its sister fruit the gooseberry.

The sources from which the market garden draws its supplies are somewhat more numerous. The potato and the tomato, representatives of a most poisonous order, Solanaceæ, the night-shades, supply a place in the dietary of civilization which it would be difficult to fill. From the natural order Liliaceæ we obtain the onion (*allium cepa*), a native of Hungary; and the asparagus (*asparagus officinalis*), a native of Europe, a plant which was eaten and praised by the inhabitants of ancient Rome, and which has lost none of its old-time reputation.

From the natural order Leguminosceæ come the pea (*satium pisum*) and the bean, of which the pole bean, the Lima bean and the white field-bean are distinct species of the genus *Phaseolus* (from phaselus, a little boat).

From the order Chinipodiaceæ, an order composed largely of weeds, we have the beet (*beta vulgaris*).

From the order Crucifereæ, we have the cabbage (*brassica oleracea*), the turnip (*brassica rapa*), the mustard (*sincipit nigra* and *alba*), and the radish (*raphanus sativa*).

From the order Umbellifereæ we have celery (*apium graviolens*), the parsnip (*pastinaca sativa*) and the carrot (*dancus carota*).

From the order Cucurbitaceæ come the cucumbers (*cucumis sativus*), the muskmelon (*cucumis melo*), and the watermelon (*cucumis cit-*

ronellus). Of these three species the cucumber is a native of Tartary and India, first brought to England in 1573. The muskmelon is a native of Asia, first brought to England in 1570. The watermelon is a native of Africa and India. In the same order we find the pumpkin (*concurbita pepo*) and the squash, the numerous varieties of which have sprung from two or three species of the same genus.

From the order Compositæ comes lettuce (*lactuca sativa*). This with the dandelion, the vegetable oyster and the artichoke, includes nearly all that this immense order, embracing at least 9,000 species, contributes to our food supply. The sweet potato (*convolvulus batatus*) belongs to the order Convolvulacæ.

In most of these plants cultivation has worked wonderful changes. It is doubtful if we would be able to recognize some of them were we to see them in their native haunts.

The cabbage is a native of Europe, growing on rocky shores and cliffs, with no sign of a head. The potato, a native of tropical America, is in its native state a rank running vine with scarcely a tuber. The apple in its wild state is an austere forest fruit. The pear in its native state is small and not palatable. What cultivation has done for these, it has in greater or less degree done for all our cultivated plants. And the end is not yet. Notwithstanding the wonderful achievements which have been made in this direction, there is scarcely a fruit cultivated which is not deficient in some degree in one or more desirable qualities. The achievements of the past furnish reasonable grounds for the hope and expectation that intelligent and persistent effort will yet remedy many of these deficiencies, and give us varieties which shall approach the perfect.

Results in this line have their possibilities and their limitations. Perhaps the most important limitation is that law of nature which confines changes within specific lines: that is, that no variation produced in one species will ever cross the line which separates that species from others, no matter how nearly allied two species may be. The varieties of the apple which may be produced from the seed are in number practically unlimited, but they will all be apples—never pears, never crab-apples. However nearly the varieties of allied species may approach each other, there is a separating line they can never be made to pass. But this limitation is useful rather than otherwise, and the possibilities within specific lines are practically unlimited. It is said that the Romans had twenty-two varieties of the apple and thirty-six varieties of the pear. I do not know what number of varieties we have now, but the number of varieties of the apple would probably exceed a thousand, and as yet the production of new varieties continues unabated. The same is true, perhaps within limits, of the grape and other fruits.

Having obtained new and valuable varieties, how are we to propagate them? We cannot do it from the seed. The most that we can count on is, that plants from the seed will be of the same species. We cannot count on their producing the same quality of fruit, or even fruit that is desirable. In fact, plants from the seed invariably tend to revert to their original type. This law is valuable, inasmuch as it makes possible and easy the production of new and important varieties. But for the same reason, it makes the propagation of such varieties when once produced impossible by this method. But this has not been left unprovided for. The plant in its embryo condition in the seed consists of two distinct parts, the radical and the plumule. When brought under the influences which awaken vital action, the radical strikes downward, forming the roots of the plant, while the plumule—at first merely a bud or growing point—pushes upward and develops into the stem or trunk of the plant. The scales which envelop the bud at its start are developed into leaves as the bud is pushed upward, and in the axils of these leaves new buds appear, which by exactly similar steps become developed into branches, and this process goes on with its continued multiplication of buds till the limit of its growth is reached. As the plant was at first developed from a single bud, so each single bud in the fully developed plant is capable under favorable circumstances of being developed into a perfect plant of the same kind, producing the same quality and variety of fruit. Grafting, budding, layering, and by cutting, are different ways in which we avail ourselves of this law, and by which the propagation of new and valuable varieties is made certain and easy.

Had Thomas Jefferson lived at this age, he would be one of the most ardent supporters of experimental stations and agricultural colleges. The "New York Tribune" furnishes some extracts from his letters which make very interesting reading. On retiring to Monticello at the end of his second term of the Presidency, he wrote to John Adams: "I return to farming with an ardor I scarcely knew in my youth, and which has got the better entirely of my love of study." Writing to David Williams, he speaks of agriculture as "a science of the very first order, counting among its handmaids the most respectable sciences, chemistry, botany, etc. Young men closing their academical education with this as the crown of all other sciences, fascinated with its solid charms, would return to the farms of their fathers and replenish and invigorate the noble calling." In 1811, at the age of sixty-one, he wrote to Mr. Peale: "I have often thought that if heaven

had given me the choice of my position and calling, it should have been on a rich spot of earth, well watered, and near a good market for the productions of the garden. No occupation is so delightful to me as the culture of the earth, and no culture comparable to that of the garden. Such a variety of subjects, some one always coming to perfection, the failure of one thing repaired by the success of another, and instead of one harvest, a continuous one through the year. But though an old man, I am a young gardener."

HOW TO GROW THE PLUM AND CHERRY.

By G. W. HOPKINS, Springfield, Mo.

My experience in growing the plum and cherry is quite limited, never having set an orchard of either of these fruits for commercial purposes. However, as I am on the program for a paper on this subject, I will bring the matter before the Society, and they can correct what mistakes I make.

I should prepare the ground thoroughly by good plowing and harrowing, the same as if I were going to set an apple orchard.

If setting an orchard of cherries alone, would plant them twenty feet apart each way. Some will say, set closer, but I believe in giving everything plenty of room.

Select good, thrifty two or three-year-old trees, with good, sound roots, and set the same as you would an apple-tree.

Be sure the trees are in good condition, as the cherry is too expensive to run any risk. Strawberries may be grown among the trees while young, or any hoed crop that may be desired.

Cherries do not need much pruning, except to cut out the small twigs which die annually. A fungus disease attacks the fruit of the cherry, said to be identical with that found on the plum and peach. It is not yet fully determined whether this can be prevented by spraying or not.

Varieties.—For commercial purposes the Early Richmond and English Morello have proven to be the most profitable. While there are many cherries that are better quality than these, yet there are no varieties that are as sure to produce an annual crop. The Ostheim and Lieb are said to be worthy of planting. They are of German origin, and as yet have not been extensively planted in this country.

For family use some sweet varieties might be planted, but for general profit they are too unreliable.

They often get killed by frost, or if they mature a crop, excessive rain will burst their tender skin, and the birds will destroy them.

Cherries have never been so extensively planted as other standard fruits. In some localities there is hardly ever a supply for home use.

Plums.—The same method may be followed in setting the plum as the cherry, except they may be planted closer. Some recommend setting them in clusters. I have seen them do as well grown in that manner as any other. Some varieties, especially the Wild Goose, should be kept cut back, as they are inclined to throw out long, slim laterals, which will bend to the ground when loaded with a crop of fruit. It is best to plant more than one variety in the same orchard for fertilizing purposes. The Wild Goose does much better when planted with some other kind. The plum has its enemy in the curculio, which is very destructive; various remedies have been tried—the most effective of which is spreading a sheet at the root of the tree, jar off the little pests and destroy them.

Varieties.—For profit and commercial purposes, the Wild Goose still stands at the head of the list in the western country.

It is a good shipper, hardy, and withstands the attacks of the curculio as well as any variety yet introduced.

The old Blue Damson is very profitable in some localities. Like the currant, it requires protection on the south, or the bark will burst, and the trunk decay.

This is caused by the sun of warm days in winter. A tree planted on the north side of the house rarely fails to bear. The Gages and other fine varieties of plums that do well east are not profitable here. It is a question as yet whether the plums introduced from Japan will be profitable here, except in certain localities.

In conclusion, I hope the brief suggestions thrown out will cause others to give their experience that will prove beneficial to those desiring to grow the cherry and plum.

FRUIT-GROWING IN HOLT.

The following very able and instructive paper was read by Hon. N. F. Murray, before the Holt County Horticultural society, September 19, 1891:

The present prosperous condition, and the financial success that has resulted from fruit-growing in recent years, must be apparent to

every observing mind of passing events. But what will the future be, is an interesting theme to all, especially so to the fruit-grower, who is compelled (not by choice) by the very nature of his profession to deal largely in futures.

By careful study and observation, one may determine, with some degree of accuracy, the varieties most in demand at present, and where investments are returning the largest profits on capital and labor. But what kind of fruit and what varieties will pay best, when the orchard I contemplate planting next spring comes into bearing, is what we all want to know. We frequently hear men wish they had planted an orchard years ago, and when we ask, why not plant one now, they will answer, "Oh, by the time it would come into bearing, fruit won't sell at a paying price." It's the same old story we have heard for thirty years, but have failed to see a fulfillment of the prophecy, for fruit in general has a demand in price all over the country, and sells in much larger quantities than ever before. But as we still hear the prediction repeated, let us inquire into the reasons upon which their faith is founded. Will the orchards now fruiting continue forever? Will our large cities die, or our foreign trade decline? Will transportation grow more costly and difficult? Will our states and territories grow their own supply of fruit? Will our population fall off or grow too poor to buy fruit except as a costly luxury?

These are all questions that may be answered with one emphatic "No," for the trees now in fruiting will soon die. The average life of an apple tree in Illinois is put at fifteen years, in Missouri at twenty. Admitting this may be too low, and put the average at twenty-five years, then all orchards must be duplicated with a new planting once in twenty-five years, in order to maintain our present production. Our towns and cities are growing rapidly. One-fourth of our population now live in town and city, whereas less than one-tenth lived in town and city fifty years ago. Our population is extending over states and territories that never can produce their own fruit. Our means of transportation is growing wider, better and cheaper each year. The American people are gaining rapidly in wealth and in intelligence, and their appetite for the best of everything sharpening. They are rapidly changing from the use of fine fruit as an expensive luxury, to its daily use as a cheap, wholesome and economic article of diet.

Our foreign trade is in a healthy and growing condition. England alone has taken \$11,000,000 worth of American fruit in the last four years, and Mr. Gladstone took occasion recently in a public speech to scold his people for not growing more fruit, and be less dependent on other countries.

If permitted, we might kindly suggest to this eminent statesman that England will have to first change her law on the ownership of land before they will be induced to engage largely in fruit-growing.

When we look at home we find some of our older states, once famous for the production of fine and abundant crops of apples, now buying their apples from Western states—largely from Missouri, which in time is destined to become the great central fruit garden of America. This falling off in the production of apples in our Eastern states is partly due to climatic changes, partly to the exhaustion of the fruit-producing elements of the soil, and to some extent, to many engaging in grape and berry culture, that give a quicker return; while in California, apple-growing has fallen off in the last few years seventy-five per cent, which is more than offset by an increased production of prunes, grapes, raisins and citrous fruits.

When we look the whole field over, we find there is beyond doubt a rapidly growing demand for increased quantities of the best American fruits, and the verdict is being won that the largest, highest colored fruit of the United States is grown in Missouri, and the best fruit of Missouri is grown in Holt county. If any doubt this, let them attend the World's Fair at Chicago in 1893.

L. A. Goodman, the best posted man in the State on fruit-growing, admits that when we consider price of land, adaptability for fruit, and our nearness to the northwestern market, there is no other place in our State that will excel; if equal, Holt county for profitable investment in fruit-growing.

Mr. D. S. Beckwith, who was here last fall and bought up so many orchards for Loomis & Co., of New York, making 30,000 barrels (and not one-half as many as they wanted), gave our apples very high praise in an article in the "Country Gentleman," recently, and said he found the best apples in Missouri on the bluffs, and the better the land was drained naturally, the better the fruit.

Prof. Swallow, in a work on geology published some twenty-five years ago, classes the loess formation (the bluffs of Northwest Missouri) the most thoroughly and naturally drained land in the West, and the best of all lands for fruit, and placed their value at \$400 an acre. In the light of our own experience, we have no reason to doubt but what Prof. Swallow knew whereof he spoke, for we know one orchard of eight acres, planted twenty years ago, that has netted \$6,400, which is forty dollars per acre for each one of the twenty years, and just ten per cent per annum on Prof. Swallow's valuation of \$400 per acre. We know of another orchard of sixteen acres, planted eighteen years, that has netted the owner over \$12,000. The land of the first orchard

cost \$15 per acre, and we challenge the world to show like results on same number of acres and cost of labor, outside this loess formation. And please remember, that this formation is confined to a small portion of country, a few counties in Iowa, Kansas, Nebraska and Northwest Missouri, except a small strip along the river Rhine in Germany, long since famous for the production of fine fruit. The cost of land in Holt county, where no artificial drainage is needed, would not cover the cost of tile drainage, outside this formation, sufficiently for orcharding.

In view of the foregoing, and many other facts in our possession that we have not time to express now, we do not hesitate to say for one moment that we have no fear whatever for the future outlook for fruit-growing in Holt county, but will predict that the industry here is yet in its infancy. We are learning how and what to plant; are learning that after all our former planting, our supply of apples, pears and peaches is not one-fourth equal to the demand. The time will come when train-loads of fruit will go from Holt county where we now ship car-loads.

Pears can be grown at a good profit, and we have less pear blight in Holt county than anywhere else I know of. In looking over the largest pear orchard in the county (1,500 trees), owned by J. N. Menifee, I failed to find a single twig blighted. Peaches are now selling, and always have in Holt county, at fifty cents to three dollars a bushel, owing to size and quality. They are selling in Delaware at ten cents a basket. Please note the difference, and remember that in Delaware, New Jersey and Michigan they have to fight the peach yellows, a contagious disease more fatal to their trees than hog cholera is to the herds of the Western farmer. In conclusion, permit me to advise all those who wish to grow fruit for market to plant only a few of the best and most thoroughly tested varieties. Give them good care, pick your fruit carefully and pack it nicely in new, clean packages of full standard size, and you need not fear but what you can sell it at paying prices, nor worry over the future outlook of fruit-growing in Holt county.

The following letter shows what people think of what some of our members are doing:

UNITED STATES DEPARTMENT OF AGRICULTURE,
DIVISION OF VEGETABLE PATHOLOGY,
WASHINGTON, D. C., Oct. 31, 1891. }

F. LIONBERGER, Hugo, Mo.:

DEAR SIR—Replying to your letter of Oct. 26th, I have to say that your observations on *Ræstelia* are exceedingly interesting. It may be as you say, that some of the *Æcidium* spores of the *Ræstelia* live

over winter, germinate in the spring, then infect the cedars. As it will be a comparatively easy matter to watch this, I would suggest that you do so during the coming winter. It may be possible also, that the *Ræstelia* is perennial in certain *Pirus*. This is another thing that will bear investigation.

I send you with this a specimen of *Gymnosporangium clavariæ-forme*.

In regard to the apple-scab, I have to say that your plan of treatment, I think, is an excellent one. It is very doubtful if much good would result from spraying, unless such precautions as you say are taken.

Enclosed you will find a number of franked envelopes.

Respectfully,

B. T. GALLOWAY, Chief.

APPLE RUST (*Ræstelia Pyrata*).

F. LIONBERGER, Hugo, Mo.

On account of the injuries done by this fungi in some sections to the apple orchards, I have during the past season given it my special attention. All the true rusts have two or three forms, which often are wholly different from one another, and in many cases grow on entirely different plants. They are all true parasites: that is, they grow upon and get all their nourishment from living plants.

The fungus in question has two forms, one growing upon cedars, while the other infests the apple leaves, and in some cases the fruit and young shoots.

The form upon the cedars is known to the botanist as *Gymnosporangium macropus*, a warty-like production, of a brown color, often attaining an inch or more in diameter. These grow during the latter part of the summer, but in spring following, after heavy rains, they begin to swell out and form a yellow jelly-like mass, known by many as cedar apples. The spores or seeds of these cedar apples germinate and grow upon the leaves, fruit and young shoots of the trees belonging to the apple family. I may remark that at present there are nine different species of these waxy productions known in the United States. They all grow upon a small group of conifers, and have their second

form, *Ræstelia*, upon trees related to the apple family. However, but few of the nine have so far been reported from the Mississippi valley, two only having come under my observation.

My notes taken on this subject were commenced on May 1, 1891. We had a heavy rain at that time, after which the so-called cedar apples (*G. Macropus*) could be seen in great abundance upon Red Cedars. I say Red Cedars because it had never been reported growing upon the White, hence no notes were taken upon the white, which I had reasons to regret as the season advanced.

On May 16, the first rust (*Ræstelia Pyrata*) was noticed upon the upper side of the leaves of the wild crabs (*Pyrus Coronaria*) growing close to infected Red Cedars. First nothing could be seen but a small yellow round spot, slightly raised above the leaves' surface. Toward the last of the month these spots became more numerous; they also grew larger. Small black specks now began to make their appearance. These are called the spermagonia. They are said to be hollow and to contain minute spores. Leading botanists tell me that their office is not yet fully understood. About June 10, the first appearance of the little cups on the under side of the leaves was noticed. They were usually arranged in circles around the spot occupied by the spermagonia on the upper side of the leaf. However, none of the cups examined with the microscope contained any matured spores until June 25. Nevertheless, the first appearance of the *Gymnosporangium Macropus* was noticed on Red Cedar, June 15, and shortly afterward on White Cedar also. The latter was somewhat of a surprise to me, as *G. Macropus* had never before been reported upon White Cedar. From this time on the spores of the *R. Pyrata* were found to be very abundant; as a consequence, in a short time both Red and White Cedar began to show the other form of the fungi in question in great profusion.

During all this time I have been watching the cultivated apples very closely, especially so Red June, Fallawater and Soulard Crab, but no trace of rust could be found, although a few years ago I had found Soulard Crab very seriously infected. I may further state that some of the wild crabs were at no time (during the present season) affected, while others standing right close I found to be literally covered with the fungus; in some cases the fruit also was infected, but no trace whatever could be found on the young shoots.

Late in the season I stopped to see a friend in a neighboring town who is taking great pride in a fence made out of cedars, which he keeps trimmed up very neat and nice. It enclosed a town lot, which is set very closely with apple trees. The cedars that compose the fence were collected in the woods at random, and I noticed that there were

about as many white as there were red cedars. All of them were very badly infected with *G. Macropus*. No difference could be found between the red and white. It was, however, too late in the season to take any notes on his trees. I showed the gentleman a specimen of *R. lacerate* upon a hawthorn leaf, which I happened to have in my notebook, explained the difference to him between it and *R. pyrate*, and then asked him whether he had ever noticed anything of the kind upon the leaves of his apple trees, to which he positively replied that he had. This is the only instance that came under my notice where rust was observed during the present season upon the cultivated apples, and it is not positive, although very probable. However, this is only one season's work; next season different results might be obtained.

My experience during the past season would fully bear out Prof. Halstead's remarks, which were in part based upon notes taken at Ames, Iowa, that in his belief the *R. Pyrata* does not do as much harm upon the cultivated apple as is generally supposed. However, if we consider the damage that had been done by the fungus in question in Marion county, Ill., prior to 1886, as shown by Prof. A. B. Seymour's most valuable paper upon the subject, prepared for the Cleveland meeting of the American Horticultural society, it is certainly very important to keep an eye upon red and white cedars.

NOTES TAKEN LATER ON APPLE RUST.

After the falling off of the leaves on the wild crabs, I had no trouble to find the *Rastelia* upon the young shoots, and at this writing (Nov. 20) I yet find them to be full of spores, which seems to strengthen my belief that the cedars are often infected from the *Æcidium* spores of the *Rastelia* that had lived over winter; and the *Rastelia* that I find now upon the young shoots may perhaps upon further investigation prove to be perennials, or they may simply stay there to keep its spores well housed over winter. I shall watch them carefully next spring to see whether they are really dead, or whether they will become active again.

After studying the *Rastelia* closely all summer and during October, finding that where young shoots were affected *Æcidium* spores were yet found in great abundance, I formed the conclusion that the spores, as stated before, might live over winter and infect the cedars the year following. I asked Prof. B. T. Galloway to give me his opinion on that point. His answer you will find enclosed.

APPLE-SCAB (*Fusicladium Dentrificum*).

F. LIONBERGER, Hugo, Mo.

This is a well-known disease of the apple family—one that every fruit-grower is familiar with. Thousands of dollars are lost every year on account of this pest. Happily, however, leading botanists have of late years been paying their special attention to this fungus, the result of which is that to-day its history is well known; more than that, different solutions have been tried and modified, until now we have chemical preparations with which the trees can be sprayed to prevent the germination of the spores. All that needs to be done is that the spraying is intelligently done and at the proper time. A few years ago, seeing that I had to expect trouble from scab, I resolved to work against it in an indirect way as much as I could. My first step was to obtain a fair knowledge of the life history of the fungus, without which my work would necessarily have to be carried on in the dark.

This obtained, I took notes during the season, a report of which I have in part given for our last winter meeting.

I found that I had a number of sorts of apples in my orchard, upon whose surface the spores would germinate so readily that if I left them, they would simply serve as a breeding place for scab in my orchard. Fortunately they were sorts that I could do without very conveniently.

So this spring several hundred trees were grafted over. A few large trees only were left for experimental purposes. But here lately, I have concluded that in my next experiments with the few remaining ones, my stump-puller will play an important part. For at this writing I have a small pile of apples from the trees mentioned, covered with scab, and it is in a fine, thrifty, growing condition, like the meadow revived by fall rains. I am afraid to put them with my other apples, which are remarkably free of scab, for if I do, and the weather continues damp, they will be sure to infect the good ones.

I am at present carrying on some experiments in that direction, by having boxes of infected apples containing also a few perfect specimens put away; some boxes exposed to moisture and others not. However, at the writing of this paper, Nov. 1, I could not yet make any report, but may be able to do so later.

Besides the above, I have also made the following observation on scab during the past season: When the apples were about one inch

in diameter, my attention was attracted to three Winesap trees, which at that time stood in clover about a foot high. The branches were drooping: that is, they were below the horizontal, enough so that some nearly touched the ground. Here I found the apples badly infected with scab, while in the top of the tree, where the air could circulate freely, none whatever could be seen. After having made this discovery I watched the trees very closely during the season, taking notes of any changes I could notice. The season until about the middle of August was wet. The consequence was that the leaves and fruit on those drooping limbs near the ground were kept damp almost constantly. The little scaly spots, being supplied with the necessary amount of heat and moisture, kept growing; in fact, they were active all the time up to the middle of August, when dry weather had set in. Very little scab was noticed about the middle of the tree, and none whatever on top. When the apples were picked, those from the top of the trees were nice, large, well-developed specimens, free of scab, while those from the lower limbs were only half-grown, full of scab, and only fit for the cider mill.

I think that is a plain case of nature teaching a lesson. I think that if no limbs were allowed too close to the ground, the balance of the tree kept carefully pruned, so that the air could circulate freely through the branches, all the weeds and rubbish kept away from the trunk, and if possible, the ground under the trees kept loose, the scab would be greatly held in check. This in a measure fully agrees with the observation made on the grape—the bunches high up on the trellis resisting the black-rot better than the ones close to the ground, where the air, on account of the more dense foliage, cannot circulate as freely.

My conclusions, therefore, in regard to the apple-scab, are: that by discarding such varieties as are known to be subject to scab in any one's locality, and, if possible, inducing neighbors to do likewise; by giving your trees clean culture, not allowing weeds and rubbish to accumulate under the trees, together with skillful pruning, and, if necessary, removing limbs that are too close to the ground, much could be done to work against apple-scab. Of course, where such treatment was not sufficient, spraying should be resorted to. However, to invest in spraying apparatus, etc., without first making good use of common-sense remedies, reminds me of men spending money on commercial fertilizers who are letting large quantities of the most valuable manures about the place go to waste, such as ashes, bones, etc. One is about as absurd as the other.

NOVEMBER 15.

Boxes of sound and infected apples that were put away to see to what extent the scab would spread where apples were in a pile, were examined. Where they were kept constantly damp I found that all the sound specimens that I had put into the boxes were more or less infected, and in each case I found the fungus to be in an active state. The infected ones that I had used were Rome Beauties; the scab had spread a great deal on them. Sound specimens of this sort were worse infected than any of the others. To be sure that I would make no mistakes, every apple that I had put into the box as perfect I had carefully examined, and where I could not find any absolutely clear of scab, the spots were carefully removed.

BITTER-ROT (*Glæosporium Fructigæum*).

F. LIONBERGER, Hugo, Mo.

This disease, causing a great deal of damage in orchards in low locations, is, like the former, the work of a fungi, and is often called scab by farmers; in fact, a great many men, even fruit-growers, get the two mixed up.

The fungus in question, unlike the scab, is very deeply seated. It seems that the germ tube finds its way into the tissue of the fruit somehow or another, a point not altogether clear to leading botanists. Where it forms a plant-body before rupturing the cuticle, the consequence is that when the diseased spots are first noticed, the fruit has already commenced to decay. Unlike in scab, fruit once infected always decays, while in the case of scab a few spots only seldom do much injury to the fruit. There is considerable complaint in this part of the State about Bitter-rot. I find the most of the infected orchards are located on low ground on creek bottoms. Orchards planted in narrow, deep valleys along small creeks, which are often covered with fog for several hours in the morning, I find to be more apt to get infected than others, and if once infected, it seems to get worse from year to year.

I find that horticultural writers usually prescribe a liberal dressing of manure, better culture, etc., claiming that there is something lacking in the soil. I think that there is about as much sense in that as in prescribing plenty of corn for stock that is eaten up by parasites. One is about as absurd as the other.

My advice would be as follows, viz., to not select any such locations for orchards. However, where a man has one so located, and infected with the fungus in question, I would first have a regular clearing up, remove all dead trees and limbs, scrape off all rough bark; this, with all other rubbish, should be burned. All decayed fruit should be carefully collected and destroyed. I think that if the trees would receive a rather severe pruning, which would cause a young and thrifty growth, and at the same time prevent the trees from bearing for a year or so, most of the spores could in that time be destroyed, and so the orchard in a manner renovated. When it would commence to bear again, if found needed, the trees could be sprayed to keep what spores were yet left from germinating. The spraying, however, would have to be intelligently done by some one that had some knowledge of the life history of the fungus; otherwise it would, of course, be uncertain. Proper attention should be given to pruning; no limbs allowed too close to the ground and perhaps weeds growing up through them. The trees should be so formed that air could circulate through them freely. Under no circumstances would I do any replanting in such an orchard unless the disease was under control, but would set out a new orchard in a better location if such could be had.



ANTHRAGNOSE OF THE RASPBERRY.

By F. LIONBERGER, Hugo, Mo.

On this disease I can only make a few notes, as I did not study it until the latter part of the summer; in fact, I did not know that it was on my place until then, so I will simply give a little of my experience, which, I think, goes to show the great importance of fruit-growers becoming better acquainted with plant diseases.

For years I had a small raspberry patch in an old field, about one-half of which consisted of Black Caps, among which the leading ones were S. Colossal and Gregg. Finally the stools of the Colossals began to die out, the Greggs did poorly, and the whole patch ceased to be profitable. So I plowed them all up and set out a new patch on richer ground, and, as I wanted some choice, extra large fruit to supply private customers, a number of whom are in the habit of canning fruit for exhibition, I again set out some S. Colossals with some Greggs, Cuthberts and Turners. While planting the Colossals, I run short of one plant to finish a row, and got a part of a stool from the old patch to

finish up. The balance of the plants used were good, strong-tip plants. They all grew fine and made nice canes, and this summer I expected a little fruit, but was surprised to find the berries imperfect; they would turn red before grown, and none were fit to eat. The plants, however, made fine stools, with a number of stray canes.

However, about the last of July I first noticed that there was something wrong, and upon a closer investigation I found that the canes from the old stool that was taken from the old patch were nearly dead. They first showed purple spots, which would grow in size and gradually turn white, or nearly so, showing plainly that it was a clear case of anthragnose. In about a week I could see that all the canes of the Colossals were infected and dying out fast.

Aug. 5th I examined the small white spots on the canes with a microscope. They seemed to be full of little spores; however, did not succeed in getting any of them loose for closer examination.

Aug. 8th, after a rain, I found that the stuff that held the spores together was in a manner melted by the rain, so that the spores could escape. Drops of water collected from deceased canes showed swarms of spores. These observations were repeated after each rain up to the 15th with similar results. It may be remarked that we had more or less rain nearly every day during that time.

Aug. 16th, after a rain, I waited until the canes were nearly dry, and again examined the drops that I could yet find, being very careful to get such as were in contact with the white spots. I found them to be full of spores, about one-fourth of which had germinated. This seemed to convince me that if the weather is favorable, the fungus will spread very rapidly. In fact, it spread to such an extent at my place that my little patch of Black Caps is hopelessly ruined. The Colossals are the worst affected. Greggs can withstand the ravages of the pest to a greater extent. None of the red ones suffered, though they were right close to the others. I take this to be the same disease that by some growers is known under the name of Raspberry Rust. Unfortunately, the term rust is very often wrongfully used.

This little experiment shows to me how very important it is for fruit-growers to become better acquainted with disease. For had I known the nature as well as the presence of the anthragnose on my grounds at the time of planting my new raspberry patch, I should certainly have taken a different course.

But as the case now is, will have to plow up my plants again. I shall be very careful to collect and burn them all and then try again, though not with Black Caps unless I can get plants from some one that does not have the disease among his plants.

STRAWBERRY LEAF BLIGHT.

By F. LIONBERGER, Hugo, Mo.

This is another parasite of the vegetable kingdom that often does a great deal of harm. I find the Michel's Early to be quite subject to the leaf-blight here, more so than any other variety that I have on my place; however, it is such a strong grower that its growth is but little checked by the fungus. This fungus is to a great many better known under the name of Strawberry Rust; however, it does not even resemble rust, and the term should not be used in its connection.

The blight in question is a little plant itself, and as soon as its plant-body is established in the strawberry leaf, the little roots, called myceloid threads, ramify among the cells of the leaf, often penetrating them in search for proper food. It is through the action of these threads in the cells, that the external characters of the disease are produced. This fungus is furnished with ample means to reproduce itself; besides the plant-body being perennial, it has a number of spore forms, the most important of which is undoubtedly the conidia form. These are produced during spring and summer, and, similar to the Uredo spores in rusts, are capable of germinating at once. Thus, when we consider the immense quantities of these spores that are produced upon the leaves of a single strawberry plant, it is no wonder that, if the weather is favorable, the disease can spread to such an enormous extent in a very short time. I do not know of any remedies, so far, that are practical.

MIND RULES THE WORLD.

An address by Prof. ALLEN MOORE, of the Chillicothe Normal, delivered before the Farmers' Institute in Chillicothe, February 10, 1892.

[Published by request of the Institute.]

MR. PRESIDENT AND GENTLEMEN—Mind rules the world. It sits enthroned above the anvil as well as in the legislative hall. It stands by the work-bench as well as in the judge's seat. It directs the plow as truly as it explains the Scripture. The higher development it receives, the better can it fill the judge's seat and the pulpit, and the

better able it is to stand at the forge or follow the plow. Mind is the agent that directs every act done by man which the other animals cannot do. Not only the highest usefulness but the highest happiness is found side by side with the highest intelligence.

But does the farmer's child need this intelligence? No living human being needs it worse. His place in the world's politics is not superseded by any other in its importance. The whole world is dependent on the farmer. Let the products of his labor fail and the cry of suffering is heard in every city.

The nicely dressed, soft-handed, smooth-haired inhabitant of the city must learn to respect the farmer as he loves his products. And it is your place to demand and command this respect. You are his equal, and in many cases his superior, and you must feel this and make him feel it. You must have that mental development that will make him feel when he stands before you that he is standing before God's noblest creature, and that he must lift his hat to the lady that makes his butter, as well as to the lady that plays the piano.

Fathers, when you send your sons to college, don't send them there that they may become lawyers or preachers, but that they may, by increased mental faculties, become better farmers. Don't send your daughters there that they may appear better in society, but that they may make better wives and better mothers.

Farmers, show wisdom in the selection of fine males and females from which to raise stock. And you know that the merits of your stock are as dependent upon the female as upon the male. The same law is as true in the realms of mind as in physical perfection. If we desire intelligent children, it is necessary that we have intelligent mothers, and this intelligence comes from mental development brought about by a course of study and school training.

Parents, do you not spend much time in preparing your fine stock for the annual exhibition held at your county fair ground? And how careful you are in the selection of their food. They are not turned out upon the commons to graze. And how anxious you are when the premiums are awarded, that the prize be given your stock. Do you give as much time in preparing your sons and daughters for the fair of life, which lasts not simply five days in September each year, but which begins with the rocking of the cradle and ends at the grave?

Are you careful to see that they have the best intellectual food that can be secured? Are you careful to see that they are not turned out upon the commons to gather the unwholesome food that may be in abundance there, but is as destructive as hemlock?

If you are not careful in these things, when the premiums are given by the great Premium Giver at the close of life's fair, your son and daughter may be found wanting and be denied the prize, which is eternal life.

Man's three-fold nature must be developed harmoniously, or he is not properly educated. I would not have you regard perfect physical development as insignificant, for it is through the physical that the mind is to act. I may conceive of a machine that will take stitches and sew, but the world is not benefited by this conception until it is applied through the physical organization upon the material world. Or I may have in my mind a clear picture of a machine that will actually cut wheat and bind it into sheaves, yet the physical man must develop this idea into a material form before it blesses the world. The mind is to plan, invent and direct, and the physical to execute. The executive power without the planning power, or the planning power without the executive power, is of no avail. Hence I say, the physical man must be cared for.

And high over all sits as judge the moral man, who acts as the balance wheel in the machine. Without this wheel the usefulness is destroyed. Morality is the keystone in the arch of life.

These three natures must be fed. It is the work of the Sunday school and church to feed the moral nature, the school, the mental nature, and the home to feed both.

The school must not only increase the mental power of the student and care for his other natures, but it must quicken his mental powers and implant within him an inspiration and a purpose. The man who starts out in life without a purpose "is like a ship without a rudder; he is a waif, a nothing, a no man." Too many persons look through dull eyes. They are like the animals in our great zoological gardens, asleep until the feeding hour comes, and then the restlessness in the cages shows that some sensation is coming along from without. They are moved by outside forces, when the living power is within. They shine by reflected light like the moon, when they ought to shine like the sun, by its own outpouring. God is willing for us to listen to and enjoy the songs of the birds, and the matchless music of Jenny Lind, but the greatest joy and happiness are to come from the kind of a developed mental activity we possess.

Absence of occupation is not rest;

A mind quite vacant is a mind distressed.

The problems of rotation of crops, fertilizing, when and how to plant, how to cultivate, what climate and soil are best adapted to certain products, when to sell, how to care for fruit trees, how to care

for stock, how to prevent and cure diseases, how to decorate and ornament the home, and a thousand other problems which the farmer alone can solve, are presented to him.

But what can a college or normal school do to assist in solving these problems? It can give him that mental development which will enable him to unlock the secret vaults of nature and possess her treasures. All nature is man's heritage. Within that skull God has placed the keystone to the universe. How to use it is the problem of life. And this problem has been best solved by those who are rocked in farm cradles, kept in motion by the same mother that turned the spinning wheel and drove the weaver's shuttle.

The present age calls upon woman for mental activity. The days of woman's intellectual darkness are past, and the light of the nineteenth century calls on her to yield wisdom's golden light. While man may yet claim the ballot and occupy the legislative and judicial chairs, yet her less noisy field is as potent in its influence, and grander in its results.

I do not ask them to prepare to take man's place in the world, but to fill their own with a dignity whose luster shines with a delicate brightness that shuns too bright a light. "The hand that rocks the cradle rules the world."

There never has been a time when the farmer needed as much education as he needs to-day. Intellect in every department of life has been quickened. The whole world of thought has been awakened, and the class that is slowest to arouse will be the greatest sufferer.

It requires more thought to manage the farm machinery of to day than that of a century ago. It requires more thought to transact the business of to-day than it did a generation ago. Life's duties are more complex, and it takes more mental force to master the problems of business life.

Farm work is not all physical. It is not all contained in plowing, planting, cultivating and gathering.

The farmer must be so educated that he can see a grandeur in his vocation not surpassed by any other business. He must live above the drudgery of farm work, and see that his calling possesses opportunities not surpassed by any other. The bustle of the city does not disturb his meditations while planting, cultivating or gathering in. He can look at the beautiful flowers at his feet and there see the pencilings of the Creator of the universe. Every leaf is a book, and even the stones beneath his feet are "stumbling blocks for the ignorant but food for the wise." If he turns his eyes upward and beholds the candles of night glimmering in the skies, that grandly true line will echo

through his soul, "The heavens declare the glory of God, and the firmament showeth His handiwork." Humanity cannot be encompassed with grander teachers. No wonder that the farm has produced the grandest men the world has ever known. The farm children must be educated to feel that there is a grandeur and an honor in farm life found nowhere else.

There is labor to be performed, but labor in a right cause is honorable and idleness a disgrace. We should strive to see how much we can do in life, and not how little.

Our sons and daughters need that education which will enable them to see that essential to the welfare and stability of this grand republic of ours is the nobility of labor.

There have been and yet are on the other side of the Atlantic two classes of society: One whose mission is to labor, and the other to consume the products of that labor. The one are called lords and the other serfs. A little of this has crossed the ocean, and there is a tendency for the idle rich to look down from their fine carriages upon the laboring classes.

We need that education which will ennoble toil and honor the toiler; which will cause this odious distinction to perish, and which will enable us to see that the true lord is the laborer and the true laborer is the lord.

It is for our educational institutions to implant within our children those seeds and those principles which will banish this stain from the brow of toil and crown the toiler with the dignity, luster and honor of a full and perfect manhood and womanhood.

THE TOXICOLOGY OF THE COPPER COMPOUNDS WHEN APPLIED AS FUNGICIDES.

After considering the chemistry of the copper compounds, the form in which they appear on the grapes, and giving a careful review of the opinions of leading chemists and medical authorities here and abroad, Professor Fairchild gave the following conclusions, based upon his examinations of grapes from the Hudson river district, where the largest amounts of copper were used:

1. The danger from the daily absorption of small quantities of copper salts with foods has been greatly exaggerated. The poisonous nature of such doses is not only not proven, but is denied by eminent authorities, whose views are supported by abundant evidence.

2. Grapes sprayed with the Bordeaux mixture according to the directions of the department in their latest publications cannot possibly contain more than 35.1000 of a grain of copper to a pound of grapes in the bunch, which amount is less than one-tenth of the amount contained in a pound of ordinary beef-liver, and absolutely inoffensive to the human system.

3. The insoluble form in which the salt of copper occurs upon the clusters, and the fact that the consumers do not eat the skins nor stems, places the mixture further still from suspicion.

4. The use of a reduced formula for the Bordeaux mixture, containing only two pounds of copper sulphate in place of six, and the substitution of the ordinary ammoniacal solution for the latest treatments immediately before ripening, will place the practice beyond the slightest possible suspicion.

Dr. Van Slyke, who analyzed the grapes from the Hudson river district, from which the grapes causing the trouble in the New York market came, gave the results of his analysis, some of which were not worked out in time to incorporate them in Professor Fairchild's paper.

The amount found on the grapes was very constant, varying from 1-125 to 1-120 grain per pound on fruit and stems. Physicians give one-fourth grain doses of copper as a tonic and astringent. Three thousand pounds, stems and all, would have to be eaten to get a dangerous amount of copper. The copper does not occur in the form of sulphate on the fruit, but as carbonate, which is not nearly so soluble.
—*Garden and Forest.*

PREPARATION OF SPRAYING MIXTURES.

From Ohio Experiment Station.

The following account includes only those compounds used during the past season. These were selected for trial because they seemed to promise the greatest usefulness of those recommended by different experimenters.

Ammoniacal Carbonate of Copper.—This is made by dissolving six ounces copper carbonate in two quarts of commercial aqua ammonia (more or less ammonia is required according to its strength), and diluting with fifty gallons of water. Although this did not prove to be so efficient as some other mixtures, it is valuable to use late in the season on grapes, and wherever the Bordeaux mixture would be objectionable because of the coating it forms.* Paris green or London purple should not be used in this mixture.

*The Horticulturist of the Canada Experiment station is quoted by Orchard and Garden as making the statement that if the Paris green or London purple is added after dilution, no harm is done to the foliage of apple trees.

Modified Eau Celeste.—Dissolve two pounds copper sulphate in one gallon of hot water; also two and one-half pounds carbonate of soda in the same quantity of hot water; when cool mix and add one quart of commercial aqua ammonia and dilute to thirty gallons. This compound is efficient and useful, but somewhat expensive and liable to injure the foliage of raspberries and pears. No doubt if diluted to fifty gallons it would be effective.* Paris green or London purple should not be used with it.

Dilute Bordeaux Mixture.—Dissolve four pounds copper sulphate in two gallons of hot water; pour this into the tank or barrel and add sufficient water to cool it. Slake four pounds of quicklime, after which add water to make a paste or milk of lime; pour this into the vessel containing the copper sulphate solution, straining through a brass wire sieve as it is poured in. This operation with lime should be repeated several times, so as to dissolve as much as possible of it. Usually a quantity will remain undissolved, but the amount taken being more than is actually required, it is not necessary to use it all. This mixture should be stirred and diluted to fifty gallons. If carefully made this mixture gives less trouble in clogging the nozzle than the strong Bordeaux mixture commonly advised. With the Vermorel nozzle it gives no trouble whatever. This mixture ranks high in efficiency, and two ounces to fifty gallons of Paris green or London purple can be used with it. It seems to have a wider range of usefulness than any other, and is confidently recommended.

Precipitated Carbonate of Copper.—This is the same as modified eau celeste with ammonia left out. It is efficient and useful, but apt to injure foliage, although it may be used upon apple trees with safety.

Ammonia-Copper Solution.—Dissolve one pound carbonate of ammonia in six quarts boiling water; add one-half pound copper sulphate, and after reaction has ceased dilute to thirty gallons. This was not satisfactory, as it injured the foliage except upon apple trees, nor was it efficient.

MANUFACTURERS AND DEALERS IN SPRAYING MACHINERY, ETC.

W. J. GREEN, Horticulturist.

This list is merely for the convenience of those who wish to know where spraying appliances may be obtained. It is not complete, but sufficiently so to serve the purpose intended. It will be well for intending purchasers to send for descriptive pamphlets, so as to compare prices, etc.

The Nixon Nozzle and Machine Co., Dayton, O., pumps, nozzles, etc.
Caswell & Ransom, Sandusky, O., orchard and vineyard spraying machines, etc.

Potts & McCoy, Columbus, O., pumps, brass tubing, hose, etc.

A. W. Livingston's sons, Columbus, O., pumps, hose, etc.

The B. F. Goodrich Co., Akron, O., manufacturers of rubber hose,

J. A. Parsons, Rocky River, O., spraying machines.

The Field Force Pump Co., Lockport, N. Y., pumps, spraying machines, etc.

The Gould Manufacturing Co., Seneca Falls, N. Y., pumps, spraying machines, etc.

Wm. Stahl, Quincy, Ill., pumps, etc.

Perfection Sprayer Co., Waterloo, Ind., spraying machines, etc.

SUMMARY.

1. The apple scab is a parasitic fungus, growing upon leaf and fruit, and flourishing in cool, moist weather.

2. The effect of the scab is to cause a large proportion of the fruit to drop while quite small; to greatly disfigure and reduce the size and market value of that which matures, and to injure the vitality of the tree by causing a premature falling of the foliage.

3. The growth of the scab fungus may be checked by spraying the trees at proper times during the spring with several of the copper compounds commonly used as fungicides.

4. The most satisfactory compound thus far tested, regard being had to cost, convenience and effectiveness, is a dilute "Bordeaux mixture," containing four pounds copper sulphate, four pounds lime and fifty gallons of water, and for insecticide, two ounces to fifty gallons of Paris green should be used.

5. While it has not been found practicable to completely prevent the growth of scab in a single season, the experiments demonstrate that it is practicable to so reduce the injury from the fungus that the total value of the crop shall be very greatly increased, and that the value of this increase will far more than repay the necessary cost of using the fungicide.

6. The effect of judicious spraying with fungicides is to check the dropping of immature fruit in the spring; to cause it to grow to larger size and more free from blemishes; to cause it to hang better to the tree while ripening; to cause it to take on higher color in ripening, and to improve its keeping quality. As measured by market value, spraying has added nearly 100 per cent to the value of the crop, at a cost of less than fifteen cents per tree.

7. It has been demonstrated that the plum curculio may be held in check by spraying almost or quite as effectually as by jarring, and far more cheaply.

SULPHURING IN FRUIT-DRYING.

By E. W. HILGARD.

[University of California—Bulletin No. 96, Agr'l Exp. Station, Berkeley, Cal.]

Of late several papers in this State have discussed the subject of the use of the sulphuring process in fruit-drying, some prefacing their articles with the remark that I had "issued another proclamation" on the subject. I am unable to remember having uttered anything in public relating to the subject since the publication of Bulletin No. 86, eighteen months ago. Since, however, the articles alluded to bring the matter forward, and imply a partial misconception of my views, and of their true basis, I think it proper to put them on record once more.

Sulphurous gas, which is formed when sulphur is burned, is well known, and constantly used as a disinfecting, bleaching and deodorizing agent, second in virtue only to chlorine. The fact that it is the agent officially used in the disinfection of infected houses, ships and individuals is conclusive on these points. It is, therefore, idle to pretend that sulphuring does not diminish the flavor of fruit or of anything else touched by it. It is perfectly certain that it does so, and the only debatable question is the extent to which it may be used for bleaching fruit without any material detriment to the flavor.

It is in evidence that a reasonable amount of bleaching can be done by applying the gas to the freshly cut fruit without injuring the flavor to a material degree, since the flavor will penetrate from the inside outward to a sufficient extent to compensate for the loss of what naturally belongs to the bleached exterior portion.

The limit, however, is a narrow one, and it is so frequently exceeded in practice (whether intentionally to secure "extra light" color to attract the unwary purchaser or, more commonly, by unskillful or negligent workmen in charge of the sulphuring boxes) as to put upon the market a good deal of fruit that is the reverse of creditable to the state that produces it, and ill calculated to insure a permanent demand. This is especially true of the thinly sliced apples and pears, which are quickly penetrated by the gas and assume a greenish-white tint that, while it may be inviting to equally "green" purchasers, assures the expert that the natural flavor is practically gone. The producer himself declines to put them on his table, but the dealer and the public, as at present informed, are willing to pay an extra price for it.

This demand for unnaturally light-colored dried fruit is a "fad" like many others, which will have its day, but will inevitably give way in the course of time to a preference for the better-flavored product having the tint which insures its being so. So long as the "fad" lasts, so long will producers or dealers sulphur the fruit to suit the eye rather than the palate of the consumer. It certainly seems desirable to hasten the advent of a more rational state of the public mind on this point; quite apart from the sanitary consideration, which, if not of primary importance as regards most of the sulphured fruit now in the market, has nevertheless proved sufficiently potent to cause the practice of sulphuring to be legally prohibited in the old world, where therefore our fruits so treated would fall under the ban of the law. An additional consideration is that this process permits of rendering third and fourth class fruit equal in appearance to the best, and is therefore easily used for fraudulent purposes.

There thus seems to me to be abundant cause for desiring and working for the abatement of the public delusion on the subject of light-colored dried fruit, which sacrifices the substance to the shadow, and is certain, in the end, to inure to the detriment of our dried-fruit trade. The over-sensitiveness that has of late manifested itself in respect to the maintenance of my position in the question seems, therefore, to be ill-founded.

I hope to find a measurably unobjectionable substitute for the uncertain process as now practiced, in the use of a solution of bi-sulphate of soda (heretofore sold under the name of California fruit salt) of definite strength, into which the cut fruit can be dipped before drying. In this process, the same agent (sulphurous gas) is employed in the liquid form, but so controlled as to the amount used that the chances of overdoing the sulphuring—now so great because of the convenience with which the fruit can be left exposed to the sulphurous gas for an indefinite time—would be reduced to a minimum. The compound can be produced very cheaply, and the solution used will be very weak.

The exact strength and time required to produce the best results with different fruits will form the subject of experiments at the station during the coming fruit season.

THE WONDERFUL ADVANCE OF FARM VALUES.

In the central West, throughout the Ohio valley, the farms which cost a dollar or two per acre fifty years ago are now held at \$40, \$50 and \$60 or more per acre, improved with commodious and substan-

tial buildings, furnished with convenient and often elegant furniture, carpets, sewing machines, libraries and musical instruments. There are indeed poorer establishments, occupied by younger or less enterprising farmers, but improvement has been general if not universal.

Beyond the Mississippi are newer lands, more recent improvements made by men who went into that region with scarcely more than willing hands and stout hearts, and their investments have virtually been created with hard and patient labor. In the enthusiasm of success, assured by strong will and stout muscles, they have borrowed money from friends in the older states, or from banks; and they are paying up their indebtedness rapidly in this season of abundant crops and good prices. But the mortgage record remains, even though nine-tenths of the debt may have been already repaid; and yet demagogues quote the entire amount as the burden that is crushing the energy and life of the young farmer.

A reliable and successful farmer of the West declares that he can purchase a farm of one hundred acres at \$100 per acre and pay its cost with the profits of its cultivation in five years. I know a farmer in the valley of the Aroostook, in Maine, in the latitude of Quebec, who bought a farm for \$7,500, paying one-third down, and two installments of \$2,500 each in two years from the product of his labor, besides making improvements and putting money in bank.—*American Agriculturist*.

SOUTHWEST MISSOURI.

One of a Series of Compositions by Pupils of the Maple Grove School, Christian County.

That part of Missouri which is known as the Southwest consists of about twenty-four counties in the southwestern part of the State.

The Ozark plateau enters the eastern boundary about two-thirds the way north, tending southwest to the southwestern corner of the State.

North of this plateau the land is largely prairie, while south of it, it is hilly and mostly timber land.

The streams at the south are numerous, and are rapid and very clear; at the north they are slow and sluggish, and not very clear.

The whole Southwest abounds in springs of cool, healthy water.

The land on the banks of the streams is not of much use for farming, as it is rocky and precipitous, with cliffs of solid rock that rise

perpendicularly from the banks. The farming land is on the ridges and in the valleys between the hills, which are quite fertile and productive. There are all varieties of soil, from the most fertile to the most indifferent, but on an average it is a very fertile country.

Although the land in some places is rocky, which requires much time and labor in removing, it is counter-balanced by the fine under-drainage, composed of sub-soil and flint rock. Southwest Missouri has no equal in under-drainage.

The principal minerals are lead and zinc; lead is found in every county, and zinc is found in the lead ore regions. There are some traces of silver, but the mines, if there are any, are not yet developed.

The climate of Southwest Missouri is, to say the least, simply splendid. And though the summer days are sometimes uncomfortably warm, the nights are cool and pleasant, and one can rest in peace without being bothered by excessive heat and hordes of mosquitoes.

The winters are seldom long, and are not very severe. Consumption, and all throat and lung diseases, are rarely found, and the climate is generally healthy.

Being not too far north, it does not suffer from extreme cold and blizzards; not too far west to be subject to grasshoppers and much drouth, and when at times there is some drouth, it is partially overcome by the moist sub-soil; and not too far south to be troubled by the intolerable heat and malaria.

Agriculture is the principal occupation, but there is some mining in the lead regions, and the coal mines in the northern counties afford occupation to quite a number.

The productions are wheat, oats and rye, corn, hay, clover, potatoes and cotton, water and muskmelons; milk, butter and cheese; horses, cattle, sheep, swine and mules. Missouri is the first State in the Union in mule-raising.

Springfield, the "Queen city of the Ozarks," is the commercial and railroad center of the Southwest. It has two systems of railroad—the Gulf and Frisco—the former has only the main line, the latter two branches, the Bolivar and Chadwick.

The city abounds in extensive manufactures, of which the most important are the railroad shops; next to these are the extensive wagon manufacturers, stove foundry, two miscellaneous foundries, three planing mills, five flouring mills, two tobacco factories, a carriage factory, furniture factory, several cigar factories, and a number of others of less note.

It affords excellent educational institutions, and is the seat of Drury college. And the school for the colored youth is worthy of men-

tion, when we consider that but a few years ago they were all in cruel bondage. Passing this school a few weeks since, I saw about two hundred colored children playing in the yard, while their teachers (also colored) stood watching them. And as I looked at them I could not help thinking that if "Honest Abe" could look down upon them now, he would smile a broad smile of satisfaction.

Springfield also has two opera houses (one of which is not yet completed) and an electric railway. The city is lighted by gas and electricity, and has a population of about twenty-five thousand.

Carthage, Nevada, Joplin, Lamar and Neosho are thriving towns and railroad centers. There are only four counties in Southwest Missouri that are destitute of railroads.

The principal rivers are the Osage, with its tributaries, Big Sac and Pomme de Terre, the White, with its tributaries, Beaver creek and James, the Finley, a tributary of James, Sprink river and Shoal creek.

The wild animals are the fox, mink, deer, wild-cat, wolf, raccoon, gopher, opossum, woodchuck, rabbit and squirrel. Also many game birds and some prairie chickens, though they are now almost extinct.

The only venomous reptiles are the copper-head, spreading adder and rattle-snake.

The early settlers of Southwest Missouri were most all from Tennessee, though now there are people here from almost every state in the Union, while the larger portion of the population of the present day are natives—altogether making a very pleasant and hospitable people, with good society, both moral and religious, while they are, to quite an extent, ambitious and progressive.

Southwest Missouri is most fortunate in regard to its location—having a wider range of profitable productions than any other state. And though people go to Minnesota, and the Dakotas, for a great wheat-raising country, to Iowa and Illinois for corn, and to the South for the cotton belt, right here in Southwest Missouri we can raise all of them, and an all-around crop failure was never known. The old farmer has rightly said: "We can raise anything from cotton to cabbage." Ohio has long been known as a famous state. I came from the northeastern part, known as the "Western Reserve," which is considered the finest part of the state. But even to that, I prefer Southwest Missouri, for reasons already given, and one other: there is not so much empty aristocracy as that which prevails in so many states.

MABEL BINGHAM,

Cassidy, Mo.

EARLY RECORDS OF AMERICAN FRUITS.

P. J. BERKMANS, in *American Agriculturist*.

As to the earliest records of fruit products in America, it is interesting to trace the many sources to which we owe their introduction. In the "History of Georgia," of the erudite Charles C. Jones, Ph. D., we find many references to the fruits cultivated by the Indian tribes, which DeLeon, DeSoto, Ribault and other early discoverers found in great abundance. In this it is stated that "the walnut, the hickory, the pecan and other nut-bearing trees were watched and nurtured. Their fruit was industriously gathered, cracked and boiled, and the oil thence obtained, 'clear as butter and of good taste,' says the gentleman of Elvas, was preserved in earthen jars." Again, we read that in May, 1540, DeSoto, before reaching the town of Canasagua, in Upper Georgia, "was met by twenty men from the village, each bearing a basket of mulberries. This fruit was here abundant and well flavored. Plum and walnut trees were growing luxuriantly throughout the country, attaining a size and beauty, without planting or pruning, which could not be surpassed in the irrigated and well-cultivated gardens of Spain." When Georgia was first settled by Europeans, there were found an abundance of peaches among the Indian tribes, from the borders of Florida to the mountains, and on the latter many varieties of apples, of excellent quality. It is well known that there existed a regular intercourse between the various tribes from the seaboard and those of the interior, and thus is explained the introduction of those fruits, the seeds of which were first obtained from the Florida Indians, who received them from the monks who accompanied the expeditions of Ribault, DeSoto, Laudonniere and others. These early missionaries planted seed of the best fruits of Europe, together with the planting of the cross of Christ upon this soil—showing that they held the cultivation of fruits second in importance, in civilizing the red man, to that of teaching him Christianity.

PROGRESS AND DEVELOPMENT OF AMERICAN POMOLOGY.

From those early beginnings sprung a class of fruits which in later days have proved most valuable to Southern fruit-growers. The type of peaches known as "Indian" throughout the Southern states is really of Spanish introduction, and, if traditions are true, this race was originally introduced into Spain and Italy by the first Crusaders, who

brought the seeds from the Holy Land. The Cherokee Indians were noted for the great variety of apples which the early white settlers found in their country, and to-day many old apple trees may be found in the mountains of Georgia and North Carolina, the relics of these early plantings. Methods of propagation other than by seed being ignored by these Indians, accounts for the many well-defined types of apples found in these old orchards. For instance, the Nickayack has doubtless been the progenitor of numberless sub-varieties, or mere forms, which bear the most marked typical characteristics. The Indian peach, first described by Cox as Columbia, who carried pits of this peach to New Jersey from Columbia county, Georgia, has, by cross-fertilization, given numberless varieties, ranging from earliest to latest, and from white freestones to yellow or dark red-fleshed clingstones, but all retaining, more or less, the peculiar stripes of the type and the purplish color of the young wood.

The Spanish missions of California bear living witness of the pomological knowledge and zeal of the Spanish monks, who surrounded these religious settlements with the choicest fruits of their native country, and to-day our brethren of the Pacific coast are reaping golden harvests from products whose beginning dates from the efforts of these soldiers of the cross. A climate wonderfully adapted to the perfect production of numberless classes of fruits, added to the careful selection of varieties and their improvement by scientific labor, has given to the world such pomological products as are, perhaps, unequalled, as a whole, in any other region of the world.

The territory known as Northwestern owes many of its early varieties of apples to that singular being called "Johnny Appleseed," who carefully saved the seeds of all the best apples which he found among the early settlers, and then, in his periodical wanderings through the forests, and in advance of civilization, planted these in some open spot, where, in after years, they proved a source of great enjoyment to the new settlers. French explorers and missionaries left many evidences of their work in still existing relics of fruit-trees, of which they planted the seeds around their posts. Thus the regions originally belonging to France, and extending from the Gulf of Mexico to and including Canada, were early stocked with the best fruits of France.

New England and the Dutch colonies received their first fruits from the early emigrants from Holland and England. As new territories became opened to settlers, the various fruits from their former homes were carried with them; thus we can account for the similarity of certain types of fruits found in sections of the Western and Eastern states. Hence, our present pomologists have been greatly aided in

their efforts to improve the fruits of their several localities by the early forethought of their predecessors and pioneers in a new country. Early in the present century we find the names of Dearborn, Manning, Prince, Cox, Hancock, as men eminent in the knowledge of fruits. Their writings produced rapid progress in this branch of production, and removed much of the confusion then existing in the nomenclature of fruits, as well as explaining many problems connected with their culture and heretofore but little understood.

AMERICAN POMOLOGICAL SOCIETY.

Soon fruit products became so abundant that a systematic effort was made imperative in bringing this class of products more prominently before the world, and thus foster, by a concert of action of the best fruit-growers, what had already become recognized as a source of wealth production. Massachusetts had already taken the lead in organizing its Horticultural society; New York followed afterward, but the first move for a congress of fruit-growers was made by the executive committee of the New York Agricultural society, to hold such a convention at Buffalo, N. Y., on September 5, 6 and 7, 1848. The name adopted by this body was the "North American Pomological Convention." In October of the same year another convention of pomologists was held, in New York city, under the auspices of the American Institute, adopting the name, "National Congress of Fruit-Growers." During the following year these two organizations consolidated, under the name of "American Pomological Congress," which held its first session at Cincinnati, Ohio, on October 2, 3 and 4, 1850, under the presidency of Dr. W. D. Brinckle. The next meeting was in Philadelphia, Pa., when the name "American Pomological Society" was adopted, and the Hon. Marshall P. Wilder elected president.

The subsequent life of this grand Society has become a part of the history of this nation, and its influence in aiding in the marvelously rapid development of American fruit products has given to it the lead of kindred associations in this as well as the Old World. For a number of years the sessions of the Society were mainly devoted to discussions upon practical fruit cultural subjects, and the publication of a list of the best fruits, and another of those whose value relegated them for rejection. The most noted American pomologists gave their increasing labors toward the success of this national organization, and their names have become household words with all fruit-growers of this and other continents. Wilder, Downing, Hancock, Barry, Thomas, Brinckle, Warder, Manning, Elliott, Prince, Kennicott, Parsons, Field, Strong, Campbell, Bryant and others were the pioneer members who

composed the illustrious phalanx, which their successors have endeavored to perpetuate, and the work of these men has placed their names upon the roll of honor of our great American citizens. For nearly forty years this Society was presided over by Marshall P. Wilder, whose fame as a pomologist and devoted citizen is known to fruit-growers throughout the world. Under his wise and paternal administration, the Society increased in numeric strength and influence, until to-day it is recognized in the Old World as a safe guide for their own associations to imitate. With the introduction of fruits from Japan, and the rapid development of the orange, and sub tropical fruit products of California and Florida, the scope of the work of the Society became necessarily enlarged, and, from the modest beginning of its first meeting, it has attained the enormous proportions of its last session. Our most advanced scientists have aided in its labors, and through their discoveries in biology, vegetable pathology, microscopy and entomology, have given to the fruit-growing public a clearer insight into the causes of diseases and failures of fruit crops, and the means to prevent or counteract the disasters which are so frequent in their pursuit. The work of the Society, while already so pre-eminent, is yet destined to achieve still greater results in the future. The generous recognition accorded to the Society by the United States Department of Agriculture will, in the future, greatly facilitate its work and increase its usefulness.

SPRAYING FRUIT PAYS WELL.

C. B. Rockwell, Hamilton, Hancock county, Ill., writes Orange Judd Farmer: I have been spraying my fruit trees for the last four years with good results, but I never did the work so thoroughly as this past season. As soon as the blossoms fell and the apples were as large as peas, I sprayed them very carefully, and in a week or ten days repeated it excepting five rows, which I left to test the value of spraying. I used one pound of London purple to 160 gallons of water, making the spray as fine as possible, and putting it on with force so as to reach every part of the tree. I have a Rumsey pump and Boss nozzle. The trees sprayed twice gave 90 per cent of a perfect crop. Where I sprayed once, I killed the codling moth, but some insects stung them more or less, so that not more than 75 per cent were perfect. No one else in 8 or 10 miles sprayed their trees, and no one else had a good crop of first class apples. An orchard of 10 acres adjoining, planted

the same time with same varieties from the same nursery, promised a good crop up to the first of June, when their fruit commenced to drop, and when gathered, not more than one-tenth were good.

My orchard has been in clover for the last five years. I do not always cut it; when I do, I leave the hay for a mulch. Observation shows that bare ground in July and August does not give the trees sufficient moisture to perfect their buds for the next year's crop, and that mulch is the best cultivation. No one who is unwilling to give the trees the full benefit of the ground should expect a good crop of apples. There are two most important things to do to insure success: Feed your trees and kill the insects. Next year I shall try London purple, 4 ounces; sulphate of copper, $\frac{1}{2}$ pound; and lime, 1 pound to 40 gallons of water. I wish some one who has tried this mixture would give results for the benefit of others. Grapes sprayed six times, once before they bloomed, and every 10 days to 2 weeks thereafter, gave a good crop, while those not sprayed produced nothing. I used 4 pounds each of sulphate of copper and lime to 30 gallons of water. A weaker solution will answer. Plums and pears were successfully treated with 2 pounds of each.

WHAT I KNOW ABOUT FLOWERS.

A Sunday-school address delivered by the late SIDNEY LAXIER at a spring festival in or about 1868, now first published in the "Sunday-School Times."

As my vision ranges over this multitude of youthful forms; as I catch the white gleam of banners, the gay fluttering of streamers, and the varied drapery of costumes; as I behold the sweet passing and changing of red and white upon these clear complexions, and the constant display of serious or merry feeling on these transparent countenances—I could easily fancy that God had spoken some word of infinite magic by which, in an instant, he had transformed a glorious field of flowers into a field of human children. Ye fair and happy faces, ye unstained eyes and innocent brows of childhood, unto what shall I liken you, of all things bright and beautiful, but unto a host of flowers fresh from a late rain of happiness, and waving in the south wind of some sweet emotion?

Now, my Sunday-school comrades, undoubtedly you are like flowers in outward form and feature. Permit me to ask: Are you like flowers also in your inward form and feature? Do you know that many of the finest and most fruitful lessons of life are to be learned by him

who lovingly studies the manners and habits of the flowers? I have been studying them. Listen, I will tell you what I know about the life and death of the flowers.

My comrades, the woods have a Sunday-school every day, and all the little boy-flowers and girl-flowers go to it. Now, the first thing, and one of the best things that I know about the life of flowers, is, that these flower-scholars never make any noise in school. It is true, sometimes they do lean over toward each other (when the wind blows) and whisper; but they whisper so very softly that it does not even interrupt the silent prayer of the trees.

Yonder is a boy who is talking. Now, if that little boy over yonder, for instance, who is talking nearly as loudly as I am, knew as much about flowers as I do, he would have learned long since how very un-flower-like it is to make a noise. Who ever heard of a tall pine stooping down to stop some violets from talking too loud? Who ever heard of a superintendent oak having to send a lily out of school for disorderly conduct? Who ever heard of a beech-tree having to tie up two daisies with a grape-vine for fighting and scratching in school? Who ever heard of a pink screaming out aloud in school because a rose stuck a pin—no, a thorn—in it? Nobody! But hasn't somebody heard of Sunday-school boys in such connections? Everybody!

Indeed, this lesson which comes from the flowers is not only a lesson for children of smaller growth, but for children of larger growth also—for men and women. I dare affirm that there is not, in all this assemblage, one single human soul but can find advantage in contemplating the serene and blessed quietude of the flowers. There is a fine German proverb which declares, "Speech is silver, but silence is gold." Who can rival the glory of the rose? And yet, who so silent in the midst of her magnificence? Ah! let us look upon the flowers; let us learn to be still.

But I said that lessons were to be learned, not only from the life of the flowers, but also from their death; and this, at last, is the sweetest lesson of all. Mark how the flowers die. Without a single unseemly struggle, without a wail of regret for sins, without a moan of pain, without a rebellious wish for long life, gently and serenely they fold their petals like arms, and exhale their blessed lives away in fragrant sighs.

Ah, my comrades, when we shall know that our Sunday-school days are over forever; when we shall hear the frosty wind that will cut us down like the flowers; when we shall feel ourselves dropping, dropping away from the stem of our life—in that moment God grant we may look back upon a life spent like the life of a flower, cheerful

in sunshine and cheerful in rain, serene in life and serene in death. In that moment God grant our souls may gently be blown upward like odors of dying flowers, greeting all Heaven and its angels with the perfumed incense of hearts which have been made as pure as God's flowers by God's grace.

A FEW WORDS ABOUT KEEPING AND RIPENING PEARS.

J. A. DURKEE, Weston, Mo.

The scarcity and consequently high prices of pears sixty or more years ago caused a very great incentive to plant largely of this fruit. Varieties adapted to the climate were not known. Of the trees planted in various parts of the settlements, no note was taken of their fitness for this or that part of the country. Most of these were seedlings, and probably only a few were grafted from selected fruit. The dependence was altogether on varieties of foreign origin; the orchards were planted in the virgin soils, rich in the substances of decaying vegetation, to which was added the best cultivation possible, in order to bring the trees to an early state for fruiting. Unfortunately these conditions were largely the cause of blight, and the ardor of the planter was diminished. But a lesson was being learned from this sad experience, and by persistent efforts of the experimenters to find the cause and a cure, and the planter to succeed if it took two trees to replace the one that blighted, we have arrived at the conclusion that we can grow pears, and at a fair profit, too.

The supply in the market for the past few years shows a marked increase, and it is certainly to be hoped that the time will not be distant when good and well-ripened pears at all seasons of the year will be cheap and plentiful.

In gathering, keeping and ripening pears a few points should be observed: First, summer and fall pears should be picked a week or more before they would mellow upon the trees; some growers say, as soon as the seeds begin to change color. On this point more practical experience and observation is needed than fixed rules could give, since the seasons vary and the time of maturity in the fruit changes. Often we have had to pick a week or more sooner than at former seasons, and during some years certain varieties will vary from their usual course. Location and nature of soil, cool and wet and dry seasons, have much to do with these causes. The early or late blooming and setting of the fruit in spring also has an effect.

An underground cellar having a cool, even temperature, somewhat damp, we consider the best place to keep the fruit the longest and in the best condition. Those having an ice-house will find this the very best place in which to store away their fruit during the months of summer and early fall. Shelves arranged along the walls of the cellar, one above the other if necessary, allowing room always for the ease of working; upon these shelves the pears may be piled six or eight inches in depth, or, what would be more convenient, shallow boxes. These could be set one upon the other, with strips an inch thick between them to admit the circulation of air. Wrapping them in paper will not be of any advantage, unless we wished to ship them shortly after storing.

The coolness of the room will so retard the process of ripening, that the grower is enabled to control the fruit from decay many days and weeks longer. Another very great advantage is gained: often the market is so over-stocked that prices run very low, which may be overcome by keeping the fruit a few days longer until a better opening appears. Cold storage is working great changes in the fruit trade of the present day.

Large and fine specimens, or others—where it is desirable to have them color up well, wrapping in soft paper is very beneficial.

Winter pears should be left on the trees as long as there is no danger of heavy freezing. The light frosts of early October will not injure their keeping qualities. Growing as long as it is safe to leave them out, will very much improve them.

To ripen them during winter, as many as may be required are placed in a much warmer temperature, and thus the process may be hastened.

REPORT ON SMALL FRUITS.

By H. SCHNELL, Glasgow, Mo.

The small fruit crop here was an abundant one, but too much rain during strawberry picking gave us lots of soft berries that could not be shipped far, and near-by markets full to overflowing—low prices were the result. Yield from four acres, about 18,000 quarts.

Varieties—Michel, Crescent, Captain Jack, Windsor Chief, Jessie, Cumberland, Warfield, Bubach, Haverland, Chas. Downing and Gandy, with a few of the newer ones. Michel, best early, too pale, rather small, good quality. Gandy, best late, not productive enough, but large, fine

and firm. Haverland, in spite of wet weather and being a soft berry, gave us good results, one of the best we had. Bubach, very fine, held out well in picking and size. Jessie, not just what it is claimed to be, but prefer it to Sharpless, and a good fertilizer for the above two. Windsor Chief and Capt. Jack will still be planted of the old "stand-bys;" can't say much for the following new ones: Stayman, Viola, Miami, Lady Rusk and Eureka; another year's trial may change matters some.

Raspberries—Three acres, mostly Black Caps, yield 10,000 quarts

Varieties—Hopkins, Tyler, Doolittle, Ohio, Gregg, Turner and Brandywine; all did well; Ohio and Hopkins the most robust; Gregg, the most tender.

Blackberries—One acre.

Varieties—Snyder and Stone's Hardy, mostly, a few Taylor and Erie; all did well; yield 4,700 quarts; low prices, too many wild ones to compete with, and hot weather and rains prevented shipping very far; tried Iowa with no profits whatever; they would spoil in 24 hours after picking; no blackberries for distant markets for me.

Grapes—Warden heads the best of the blacks with us; Niagara, Pocklington and Diamond for white, and Woodruff's Red for reds; Early Victor and Massasoit rotted; Empire State and Goethe mildewed.

Currants and gooseberries both fine, except Downing gooseberry was a failure.

COLOR FOR WINTER'S RELIEF.

CHEER AND BRIGHTNESS OUT-DOORS AND IN.

By E. P. POWELL, in American Gardening.

Everybody that is normal loves bright colors. Nature revels in color. I am glad we have got by the fad of neutral tints, which was only the deification of dust. There was no bottom to the fashion. It created so far as possible a dull uniformity about our homes. We have a right to whatever makes our emotions cheerful and bright. Red is delightful to old age, and yellow to young life; and there is no reason why our houses should not be painted or colored with what is adapted to their occupants.

When a resident of Chicago, a few years ago, I visited the kindergartens, and inquired which color was first chosen by small children. In every case it was yellow, with but one exception. The relation of color to us is far more intimate than is generally supposed. The blue ray predominates in the sunlight of spring; the yellow in that of summer; the red in that of autumn. This corresponds exactly with the relation of colors to our ages; blue for the mother and babe, yellow for the rapidly growing child, and red for the mature adult. Experiments in European retreats show that color has so vast an influence on the mind that excitably insane persons cannot endure red; but the melancholy need red and cannot endure blue; so there is something in the expression, "I feel blue."

Horticulture has more to do with color than any other art except painting. Our plantings should look not only to flower and foliage, and grouping, but also to the colors that are possible, and their right adjustment to the seasons. Nature gives us the cue in making a specialty of brightness as the year falls into decay. But man has needs beyond those of the rest of creation. It is specially desirable that we shall be able to brighten up November and December, and even secure cheering nooks all winter, and this we can do. There are trees and shrubs that are inspiring and joyous all through November, and others that do not fail us until spring.

The most superb glory of November in America is the euonymus, an inconspicuous affair, without a suggestion of unusual loveliness all summer. In October its seed-pods color a lovely pink. When we have begun to say that these can hardly be surpassed, lo, they burst open and show us a heart of brilliant scarlet. It is the purest, warmest color in the American woodlands. The shrub does admirably well on our lawns, in all sorts of soil, and either on upland or lowland. It stands, when full-grown, about eight feet high, and in November hangs loaded, like a cherry-tree, with fruit. The color is not unlike that of a Morello cherry. The flower comes in June, and, while delicate and deliciously sweet, is inconspicuous. I can hardly over-praise the euonymus. It should be very liberally planted in all directions from our windows. Alike on dull and dripping or on sunny November and December days, it stands full of cheer and brightness.

The European sort has yellow berries and is not so happy a shrub; besides, it is infested with lice and must be syringed with kerosene emulsion, or it will become unsightly. All through the Northern states and far south our American sort grows wild in rich lands bordering on swamps. The effect is superb. It can be obtained from all good nurserymen. But I wish they would talk more about it.

Its noble companion (they are *par nobile fratrum*) is the European barberry—now adopted by our own woods, and found freely growing everywhere in the northern states. In many ways this shrub is so useful as to merit a place very near the head of all we can select for our lawns. In flower it is superbly graceful and sweet—too sweet for some persons. It is eminently a bee-feeding, honey-making flower. The long tresses hang for three weeks in June, covering the bushes. But the glory of the plant comes, after all, in October and November. The berries color as early as August, but are not conspicuously bright until the leaves fall and bright spots are specially needed. Then bursts forth the blaze of crimson scarlet. It is literally a burning bush. I have one standing ten feet high and ten feet in diameter through the spread of the limbs, which weep until they touch the ground.

For natural green this barberry surpasses all the so-called weepers. The berries are also useful for jelly and marmalade, if you have so many that you can afford to strip a few bushes. For my part, I prefer the color on the lawn. The taste is delicious to an irritated stomach, and some dyspeptics claim much benefit from using the fruit. I do not intend to over-praise the barberry, but it cannot easily have too much said for it. Our wild shrubs are our best, but are thought less of than inferior sorts brought at much greater expense from far-off countries.

The third bush that deserves great prominence, also a native and found over a vast range of territory, is the red-barked dogwood. The peculiarity of this is that the bark colors a vivid crimson in autumn, and remains bright red all winter until the leaves unfold in spring. The change of color begins with the ripening of the berries, but is not always completed at that season. This fall the color was dull for a month after the foliage fell. But all through the cold season this dogwood sits on the snow-bank like a glowing fire. Of course no extreme cold affects it. The euonymus passes its prime by or before Christmas, often by the first of December. The barberry and dogwood are fine through the whole winter. This bush grows naturally in the lowlands and revels in wet places; but it grows fairly well on uplands. It may be planted in sun or shade. In wet soil it spreads by layering its limbs, which droop over and readily catch roots in the soil. The barberry also adapts itself to shade as well as sun.

I have standing before my window a superb mountain-ash, which has been glorious with its load of clustered berries for three months. Do our people realize what a superb affair this may be? It likes a cool spot, but grows well in poor and rich soil. It should be trimmed with care so that it will not become too bushy, and then there will be such a revelation of the beautiful in color as no other tree gives. I do

not think we have its equal in that respect. Some years the robins will take all the fruit, but we have no right to undertake fine lawns and gardens without counting in the birds and preparing food for them. Hedges of Tartarian honeysuckles delight them, and we can save our favorite mountain ash trees from spoliation by syringing them with kerosene emulsion. In this way I got rid of damage from the robins in August, but the flocks in October, as they passed south, stopped and took a meal—quite to my satisfaction, for the tree was so loaded that a bushel could be spared from the top before the snows weighed it down. I have other trees that I leave to the birds cheerfully. The mountain ash is subject to borers, but these can easily be destroyed by a wire and sharp knife. The foliage as well as the fruit is elegant, and the flower gives a vast amount of honey and bee-food.

We may add to our list the high or bush cranberry (*Viburnum oxycoccus*). This bush, rather homely while in bloom, deserves a chance late in autumn. I like it best where the others are least valuable, in clumps and under hedge rows and by stone walls—in all odd and out-of-the-way places. It is a good bush for mixed groups. Birds seldom meddle with the fruit, and it is frequently conspicuous all winter; but its finest show is before Christmas. The berries are soft and not so enduring as those of the barberry.

One special use of all the berries I have enumerated is home decoration. Branches of the mountain ash are truly superb in large vases, or fastened elsewhere about our rooms. The barberry holds its color and richness for many weeks indoors. The euonymus is especially fine for a shorter time.

We have in the above list all that are needed to brighten our yards and lawns in the dull days of late autumn, and to counteract the winter's chill. We have two more colors to care for to complete our planting. The green of summer can be retained by having plenty of hemlock trees, bushes and hedges. This is the finest of our winter evergreens. Savin or junipers in general give us good clippings for winter bouquets; while the mahonia should be always on hand for Christmas. In my judgment, the chief use of evergreens is to secure green for the brown months; and I have planted my own lawn with this object in view.

Among the browns we may also get great delight from a few trees and bushes that have rich tints and persistent foliage. Among them are the scarlet oak, first scarlet and then rich brown through November and often till Christmas; while the beeches, more especially the purple and copper varieties, are charming all winter. What can be

finer in winter than an oak forest or a beech grove? Americans have so far generally failed to appreciate these two trees. In our Western states I have seen the most complete homesteads in the middle of great oak groves—trees of the aboriginal forest. I know only one beech park in America, and only a few fine beech groves. But apart from its exquisite sweetness and wholesomeness, the beech is eminently fine for the purpose I have specified.

Our winters are so long that it is irrational to plant for summer only. The foliage begins to drop in the Northern states generally by the first of October. Ash and butternut trees are bare early in that month. By November the general aspect is that of defoliation. We have then five months or more without relief of color, unless we plant specially to supply the lack.

PLANTS FOR THE HOUSE.

I do not think our people generally understand the art of enlivening winter with plants and flowers at the least expense and trouble. I was long accustomed to pot a quantity of bedding-plants, and had more work than flowers. Geraniums and common bedding-plants can be so cheaply bought in quantity of greenhouse-men in the spring, that it does not pay to keep them through winter. If something rare is in our beds, it may be advisable to pot it; otherwise let all freeze in winter and buy anew. Of course, if one has a light and dry cellar or a plant-pit, the plants can be easily lifted and stored. But to lumber a small conservatory or our windows with cheap plants is a mistake.

For a while I adopted the plan of filling my windows and conservatory with caladiums, begonias, and other fine foliage plants. These were charming, and gave, of course, as much good bloom as foliage. I will not say that I won't return some day to my semi-tropical pets; but they cost a good deal in the long run, and one must know how to take care of them. Dwarf oranges in bloom and fruit, with jessamines, noyas, etc., fill a house with delicious and healthful odors; but you can do quite as well without the expense, as follows:

Lift in October or November as many short stocky lilacs, syringas or mock-oranges, deutzias, bush or Tartarian honeysuckles, *Spirea prunifolia*, and other early-flowering common shrubs, as you can care for; place them in your cellar in cheap boxes or in half kegs; water very little. About three weeks before you desire a blooming of either sort of shrubs, bring up to your kitchen window, or conservatory if you have one, as many as you choose. As the buds start, simply water profusely, and give all the light you can. You will shortly have May in January or February. Nothing can be more delightful. The lilac is

the best of all forcing-shrubs, and is quite as sweet as when blossoming out-of-doors. *Deutzia gracilis* is very pretty in clouds of white, but it is not sweet. Mock-orange is liable to drop some buds, but is very sweet and lovely. The yellow currant or native ribes is another first-rate shrub for the purpose.

When they have finished flowering, set the bushes back in the cellar till spring, only do not let them dry up nor over-water them. In April or May set them in the ground, and in two years they can again be used for forcing. In order to have short, stocky bushes, one should take suckers from established shrubs and set them in a row in his garden, and trim them down. Of course a full-grown lilac tree will not serve our purpose; nor will shoots without flower-buds. A three-year-old bush will have flower-buds as a rule. How can you be sure about it? By the shape of the buds; they are rounder and larger than leaf-buds.

My next plan for winter flowers is to make for indoors window-boxes that just fit into the windows, and are seven or eight inches deep and ten or twelve wide. These are filled with good soil and sand, and planted with tulips, freesias, etc. I do not prefer hyacinths for windows, because as soon as the tip-flower begins to fade it sends out a rotten odor which is unwholesome. But the tulip is not a sensuous flower at any stage; and there are just as sweet tulips as there are hyacinths. The freesia is simply a noble flower. Its fragrance is delicious. Its bulbs are small and can be planted with the tulips. I am far from being captivated with the sacred narcissus, or Chinese flower, that so many are growing just now. It is not pretty; but there are pretty jonquils, and not one is finer than our common daffodil, Von Sion. It is easily forced. So is our lily of the valley. Window-boxes will do for all of these. They must have plenty of light and water. They will fail if set back from the glass.

I do not feel quite content without a few pots of lilies. *Candidum* will do; and there is nothing in the garden better than the common tuberous-rooted or lemon lily. This sort sends up stem after stem of fine, delicate yellow flowers that fill the house with perfume. The orange-colored is a less handsome sort, and less sweet. These I place in pots in the cellar for a few weeks, and bring forward as wanted. *Lilium longiflorum* and *L. Harrisii*, or Easter lily, or Bermuda, should also be freely potted. You can buy them at wholesale in lots of fifty or twenty-five so cheap that you can afford to plant all you have room for or care to have. Plant one bulb in a six-inch pot. Get them well rooted in the cellar before they are brought to the light. This will require from three to four or five weeks. They can stay longer in the

cellar if you desire. Bring up a few at a time, and then water them freely and regularly. In the cellar water sparingly. I also pot a dozen or so of *Lilium auratum*, but they are not so sure of giving invariably good results.

If you do not desire to spend any money on winter plants, you will, of course, take the lemon lily, which almost all people have in their gardens. Dig up a big bunch and cut it into pieces small enough for twelve-inch pots. Do not crowd too much. Most people have also the little white candidum lily. This can be forced very nicely with care, but should be near the glass. Other sorts do quite as well.

When bulbs or tubers are through blooming, they can be replanted in the garden, and will recuperate in a couple of years, but must not be kept in pots two successive years.

A very charming winter flower, apart from these, is the double-flowering rubus or blueberry, which some call the bridal rose. Another is the white hellebore or Christmas rose. This, however, will blossom out-of-doors until heavy snows, and may be dug out of the snow for Christmas. Then, if you intend to keep a few pots, keep sweet flowers in preference to showy ones. They generate ozone and help to purify the atmosphere of your rooms. I prefer tropæolums, heliotropes, and the old-fashioned rose and apple-scented and penny-royal geraniums. These are out of style, but ought to come back; they have never gone from those who love real merit.

Oneida Co., N. Y.

OLD ORCHARDS.

By R. LYNN, Tarkio, Missouri.

Old orchards may be divided into two classes: First, the old, long-neglected orchard; half the trees are dead and the survivors are half dead. If the old resident still owns it, I wouldn't meddle with it; but like the daft old man with his old shoes who carried them "for the good they had done." If a progressive man has come in possession, let him cut down the old eye-sore for fire-wood, and plant a new orchard of approved sorts and give it intelligent attention. Second, the orchard that is only growing old. This begins in Missouri twelve or fourteen years from planting, and will reach the stage of the first-class at twenty years if neglected. It is rare to find an orchard that has not been neglected to some extent during its best years.

We are first admonished that our trees are getting past their youth by seeing them bearing large crops of small apples. The Winesap first, then the Janet and other leading sorts encumber us with a large lot of that most puzzling of property, too small to ship and too good to throw away. The prince of commercial apples, Ben Davis, don't do as the last named. It bears good-sized fruit till it feels neglect, then begins to decay and is hard to recuperate. Now is the time to treat the orchard as old. But better not wait till it shows many wrinkles. Begin to ward off age while trees are in their prime. Begin by cutting out all low or drooping limbs, that a team may have room to work. Cut out also all trees of barren or useless sorts. Then haul and spread on a good coat of manure, say a good load to every two trees, and plow it in with a 12-inch plow, being careful to plow shallow. This can be done in spring. Harrow right away, and harrow again, or if in blue-grass plow again, and harrow before the limbs bend down with fruit. Next year let a good crop of weeds grow till June, then hang a heavy chain on the double-trees and plow the weeds under, and harrow and cross-harrow as before. When the weeds grow up, run the mowing machine through the orchard if a team can get through; repeat the plowing, harrowing and mowing each year, and give the good old trees all the food you can in the shape of manure, lime or any rubbish.

The best manager of an old orchard I ever knew took a block and hand-ax through his orchard, and cut all the prunings in short pieces and left them spread under the tree. He had a flock of sheep which he turned in for only a few days at a time, which saved him the trouble of mowing the weeds and helped to enrich the land.

It can be readily seen by any reasoning man, that any land must be fed and cultivated to continue to yield good crops of anything.

The best orange orchards of California, which pay such big profits, would and do cease to be profitable as soon as cultivation is withheld. The cultivation is constant and thorough; and even on their best land fertilizers are found to be a very profitable investment. Of course, where orchards pay annually from \$400 to \$1,000 per acre, they can afford to do their very best. We could not on our loose rolling prairie land keep our orchards cultivated all the summer. We need the crop of green weeds to prevent the land from washing and leaving the tree roots exposed; but weeds should never be allowed to go to seed; green weeds plowed under, or cut and left on the surface, enrich the land, but if the weeds are permitted to mature their seeds, the land is impoverished every time. Of course good sensible pruning is necessary in the management of old as well as young orchards, and implies cutting out all dying branches and all suckers, excepting where there is a

vacancy in the head of a tree, a strong sucker should be left to fill the place. If an old orchard is infested with bark-lice it should be washed with weak lye; if with caterpillars, either in the spring or summer, they should be destroyed as soon as seen; if with borers, they should be extirpated; and indeed, every treatment that is good for a young orchard is equally good for an old one.

LOOKING BOTH WAYS.

By W. R. LAUGHLIN, College Springs, Iowa.

Backward for thirty-nine years. Forward to all the future.

My first acquaintance with this region was in April and May, 1853. Kansas City was then "Independence landing." Leavenworth was fort and village. St. Joseph was a small town, but a very lively outfitting place for a large share of the hordes that swarmed across the plains and over the mountains to Oregon and California.

Des Moines was the fort, the old trading post buildings and some scattering new houses. Kanessville, now Council Bluffs, had the garri-son and an irregular muddle of temporary houses in and on either side of a narrow creek bottom. The first shanty had not been built where now is Omaha.

Here and there, miles apart, beside the streams, sheltered among the timber, was one of the very first settlers. A few had just stopped at some one of the groves that nature had scattered with a sparing hand, mere dots in the prairie sea, between the narrow skirts of timber where the trees held their footing along the streams. The grand rolling prairie of rich soil was swept by the gales with nothing to hinder or vex, save the few trees that covered not one-twentieth of the country.

The wild game was scarcely disturbed, and that spring the wilderness rang with the shrieking of thousands of wolves and the strange booming noise of millions of prairie-chickens.

Along the lines of travel where the emigrations moved were well-worn roads with a few small bridges, a few ferries and many fords.

The foundation was here, but the building of civilization was scarcely dreamed of. The advance guard, the first only of the pioneers, were viewing the land. It was discovered, but only partly explored.

To-day, 1892, no better, no really higher state of human existence can be found in any region of all our grand and proud Republic than

is in adjacent parts of four states, two of them west of the Missouri river, one east of it and one through which it runs.

In all that has made the present better than it was thirty-nine years ago, the trees planted by the hand of man have been a very significant factor. They surround and protect the country homes, and the farm animals go under them to find shade in summer and shelter in winter. Some of the villages have become groves where the winter gales lose much of their dreaded power, and the fierceness of summer heat is tempered by the leaves that shield us from the summer sun. There nestle the gardens, the shrubbery and the flowers.

The fruits of the latitude are plenty in nearly every house and the beauty is over all.

We have now the experience from the first with the native trees, and with evergreens for thirty-three years. Let us put each variety on trial and hear the evidence. Shelter, shade, timber and beauty: let us go to the record of already more than the lifetime of a generation, and learn much as to what we and our children should plant hereafter.

It is a present question; another spring will soon be here.

In the spring of 1859, my father brought down the Illinois river and up the Missouri a large lot of fruit-trees, a choice selection of ornamental trees and shrubbery, and an extensive venture of evergreens. The handling of evergreens was then an experiment; they were costly. Many lacked faith in their success on the prairie, but other many, with eyes for beauty and with hope of their usefulness, willing to pay the price, to do the work and to wait for results, bought and planted.

That importation of 1859 was distributed to the homes of men of carefulness, here a few and there a few, for fifty miles around our nursery place. We ourselves planted on our own places groves of them. These groves and the evergreens that are by and around hundreds of homes are object-lessons that may be seen afar off and carefully studied near at hand. He that passes may read; he that feels their protection when the blizzard is abroad will ponder, and he that enjoys their shade in summer as he reclines will mentally digest.

Many farmers here have for fifteen or even for twenty years taken their whole supply of fuel from their own places.

Ask some man who has a hundred hogs, fifty head of cattle, and a dozen or twenty horses, what he would take for his grove of soft maples, burr-oaks, elms, or of varieties mixed. Or better still, if he has a goodly lot of large evergreens, where his stock can run under them, ask him to set a price on that. Ask his neighbor who has that wind-break planted a dozen years ago, or more, what he will take to let it be cut down.

There stands a snug, comfortable farm-house. Around it are one hundred evergreens; seventy-five of them stand guard between that home and the northwestern gales; twenty-five are on the lawn, where they are oftenest seen. Knock at that door, ax in hand, and ask the woman and the children too, for how much, or for what, they will allow you to make their evergreens into Christmas trees. When all these answers are in you will understand why, and how much, people in this region value their trees.

J. G. Laughlin & Sons brought here and tested 123 varieties of apples. If they were planting a family orchard this year, not more than twenty varieties would find place in it. If planting a commercial orchard, it would be of not more than half a dozen.

Not one variety of evergreens in five that we and our neighbors have proved is it worth while to plant.

There is much of experimenting yet to be done with some of the evergreens that have lately been found; but my advice to the farmer is to let the nurserymen and amateurs do that. It is their trade, and years will tell the story. They can and will make it pay, and the people can well afford to pay them for doing it.

As is the Ben Davis among apples and the Concord among grapes, so is the White Pine among the evergreens. It is everybody's tree; it flourishes anywhere in this latitude; it is a good tree for every purpose for which evergreens are wanted. It grows fast while it is young, and keeps on growing fast for a long time, even for centuries. If not crowded or trimmed up, its limbs grow long and branching near the ground, and are healthy and full of leaves. Its body is straight and keeps its size well up. Its limbs come from the body in just the shape to make it one of the best for the small boy or girl to climb. Sleet never hurts it. None of the evergreens keep their color better in winter, and when the love-light of the spring-time comes and they are leaving and preparing for seeding, no variety puts on a more attractive flush.

Plant it for shelter, for shade, for timber and for the higher use of beauty. Specimens on the old nursery place, set in 1859, range from sixteen to twenty inches in diameter two feet from the ground. It may be planted for timber six feet apart each way; if for shelter, twelve or fifteen.

RED PINE.

I know of but two. These were planted by my brother fifteen years ago. The larger of the two measures, one foot from the ground, fourteen inches in diameter. They are straight-bodied, about twenty-five feet high, handsome, and seem to have no faults.

RED CEDAR

Has done very best here. Its growth of timber is not the largest in size, but is perhaps the most valuable. It is quite a beauty in summer, though it is of a dingy color in winter. For wind-breaks it is one of the best. It is long-lived, and is pleasantly fragrant. For timber it may be planted five feet apart each way; if for shelter, ten or twelve.

Be very careful of whom you buy trees of the Red Cedar. Trees from seed grown at all east of here, or from two hundred miles south, or from as far north, will not do well here. The very best trees are from seed gathered on the Upper Platte; and even there can be found two varieties, one very much better than the other. Only an expert is able to make sure work of gathering seed of the Red Cedar.

NORWAY SPRUCE.

In form of tree, shaping of the branches and leaves, and in color, winter and summer, one of the best. An upright grower, tall, and all looking alike. Very good for wind-breaks. Never split or broken by sleet. When twelve or fifteen years old it takes on a drooping habit, which adds to its peculiar style of beauty, and makes it one of the best of high wind-breaks. Should be planted fifteen feet apart each way. The Norway Spruces now look as if they might be good for a century or more.

AUSTRIAN PINE

Grows very strong for twenty years; after that it is a scraggy nuisance.

SCOTCH PINE

Makes a large growth for twenty-five years, and then becomes a scrag

AMERICAN ARBOR VITÆ.

A few for lasting ornaments. Of the other varieties of this species, a few on the lawn.

IRISH JUNIPER

Is a beauty for say fifteen years, and then should be removed.

BALSAM FIR.

A very good Evergreen, but not to be long-lived here. Trees thirty-three years old look as if they were of age.

OF NATIVE TREES.

The Burr Oak starts slow, but soon becomes a good grower. Handsome, good for a shade tree, and best for timber. Plant it and wait; it will reward you, and it will pay you, and be here for the coming generations.

RED ELM.

There are some fine and large. One of the best natives for shade, and has much of its own style of beauty. It also is a tree for the generations.

SYCAMORES.

We have thirty years old, seventy feet high, and fifteen inches in diameter; sound, healthy, and quite handsome the year round. Evidently they are here to stay.

BLACK AND WHITE WALNUT.

For timber they are failures here. Not good for shade or shelter. Both bear plenty of nuts.

THE ASH

Is doing well. A good, neat and clean tree.

SOFT MAPLE

Grows very fast, and is likely to last well. Shade, shelter, beauty and summer fire-wood.

HARD MAPLE.

A part of the importation of 1859 was a few very small Hard Maples. To-day they are twelve to fifteen inches in diameter, about fifty feet high, and look as if they might last a thousand years.

Nothing injures them. They never let go their grip of the ground, and never lose an inch from their upward or outward growing limbs. Attractive even in their nakedness in winter; graceful among the trees in spring; beautiful in their full dress in summer, and grand in their fall-time glory of colors. Handsome, very handsome in their babyhood, lovely in their youth, and magnificent in the pride of their maturity. But they grow slowly, oh, so slow! Plant them for your own sake. Plant them that your children may be the better for their planting, and that your great-grandchildren may rest under their shade when both they and the maples are old.

Cottonwood, Box Elder, Honey Locust, Black Locust and some others are wiped from the slate.

OSAGE ORANGE.

If I were planting timber for the money only, and were confined to one variety, the Osage Orange would be my first choice. There is too much to be said for the Osage Orange to allow it room in this paper.

RUSSIAN MULBERRY.

Selected varieties, multiplied by grafting, to raise food for the birds, and so save other fruits. Who will carefully and honestly do that selecting and propagating?

OF EVERGREENS.

Plant only trees that have been raised from seed, in the nursery. Forest seedlings may live when carefully handled and the season is very favorable, but nursery seedlings, well raised and in good condition, are ten times more sure. They will make larger growths for the first few years, and be bigger, better trees ever after. The proof of this is all around me.

If you deal with the right kind of nurserymen your trees will come to hand safe and sound, and the varieties will be true to name.

The fewer minutes, by the watch, that you allow the roots to be exposed to the air, the better. If you are to take them from the nursery in a wagon, be sure to puddle the roots in a rather thick loblolly, and sprinkle over that a coating of fine, dry dust, and then cover them well.

Have your holes deep and wide enough to hold the roots when in a natural position. Get down on your knees and with your hands place and pack the soil among the roots, and when filled two inches above the roots, tramp very tightly if the soil be at all dry; the wetter, the less tramping. If the soil is in good order, or wetter, do not put in any water. Over all throw loose soil so that the surface will be two or three inches above the level. Cultivate as carefully as you do anything in the garden. Do not cultivate more than three inches deep, or you will surely injure the roots and damage the trees.

In a few years the fallen leaves will form just the right mulch. Then mow down the weeds and all volunteer stuff. In ten or twelve years evergreens so treated will have such a good hold on the ground that they will continue to do well if the plot is sown with grass—even with blue-grass.

Evidently, with some of our nurserymen, there is a good deal of confusion of varieties of some of the species, the Firs and the Spruces especially. There are nurserymen who know enough and are honest enough to send just what you order.

The most cautious and clearest-headed of the old settlers here agree that the climate is very much milder than thirty years ago, and if you ask them as to the cause, they answer, "the trees." If a few gallons of oil will control the waves of the ocean, as seamen, ship own-

ers and insurance companies have come to believe it will, why may we not believe that the groves and the hedges have much to do with restraining the winds and lessening the severity of the climate?

This middle time of February the deciduous trees are naked and bare. Countless limbs and twigs on each one of uncounted thousands of trees are helping in their way to break into smaller and antagonizing currents the great stream that is this day pouring from the northwest. Myriads of myriads of sleeping, waiting buds are swinging from the swaying branches. They bide their time, and the cold, the gale nor the sleet can destroy them, for they are well wrapped and are safely connected with the snow-robed earth. They are the promise of the leaves, the blossoms and the fruits for another summer. These leafless trees give much of shelter to-day. For that purpose they are far better than no trees.

But we will go among the evergreen groves. Ah, here it is almost still. The gale that pours and roars among the tree-tops is stayed and broken by the Pines, the Cedars and the Spruces, till it only reaches us in slight and fitful puffs.

Plant trees. Plant all manner of trees for summer, but for winter plant evergreens.

A MODEL FRUIT FARM IN THE MOUNTAINS OF HOWELL COUNTY.

There are few Missourians who are aware of the fact that nestling down among the foot-hills of the Ozark mountains, in Howell county, is the largest fruit farm in the United States. Such is the fact, however, and while Missouri is nominally the fifth State in the Union, according to the census, she is in reality the first in many respects. The fruit farm referred to is owned by the Olden Fruit Co. It is located at Olden, in Howell county, eight miles north of West Plains and 100 miles southeast of Springfield, and is on the line of the Springfield and Memphis railroad. The company was organized in 1884, and its officers are J. K. Cravens of Kansas City, president; L. A. Goodman, of Westport, secretary; J. C. Evans, of Harlem, treasurer. W. G. Gano is the superintendent of the farm and resides at Olden.

Mr. L. A. Goodman, who is secretary of the company, and also secretary of the State Horticultural society, has been in the city several days on business connected with the annual report of the society. Speaking of the farm yesterday, he gave some interesting facts concerning it. He said:

"In the spring of 1884, just after the company was formed, we put out 18,000 peach trees; in the spring of '85, 12,000 peach and 3,000 apple trees, and we have planted each year since then from 5,000 to 10,000 trees. We now have forty acres in berries, 300 acres in apples (20,000 trees), 300 acres in peaches (50,000 trees), and sixty acres to be planted this spring. We also have twenty acres (3,000 trees) in pears and cherries, making a total of 720 acres, and about 80,000 trees. We will continue planting each year from 50 to 100 acres.

"We have," continued Mr. Goodman, "2,600 acres of land and a station, store, postoffice and express office, located in the center of the tract, and roads leading to all parts of the farm, making not only the largest fruit farm, in a body, in the country, but specially located in regard to reaching the station easily with the fruit from all parts of the farm.

"Peach trees began bearing three years ago, and we sold 3,000 bushels. Two years ago we sold about 8,000 bushels, and 24,000 boxes of berries.

"Last year the peach crop failed, and we sold only about 36,000 boxes of berries and 1,500 bushels of apples. Prospects are now, this year, that we shall have between 30,000 and 40,000 peach trees bear, and, as the buds are still in good condition, we hope to have a full crop of peaches. We will have also 5,000 to 10,000 apple trees in bearing this year; prospects good, also.

"We plant altogether on new land, cut the timber off, save enough for posts and rails and burn all the rest on the ground. We cut this off in the summer and break up the land during the winter with four large mules. Cross-plow this in the spring and harrow well. Mark off the land with a plow, twenty-five feet apart each way for apples and sixteen and one-half feet each way for peaches. Dig holes at the crossing and plant in this virgin soil. We plant corn or potatoes on this land for three years, and then cultivate the peach trees well every year without any crop. We thus get the benefit of the new soil and the trees are not starved for food. The apple orchard we plant in corn for two years longer, and then plant nothing. But every year the land in these orchards is plowed and cultivated with a double-shovel, just the same as if there was a crop of corn on the ground. Each spring, also, the peach trees are cut back about one-third of their growth, making them stocky and the fruit easily to be gathered.

"To this care and cultivation do we attribute our success in growing fruit. There need be no such thing as failure, if we only give our orchards proper care, cultivation, and plant no crop in the orchard after beginning to bear.

"The soil in Howell county is the 'red lands of the Ozarks,' and is very peculiarly adapted to the raising of the peach. To this country are turned the eyes of the peach-growers of Delaware, New Jersey and Maryland, looking for a peach belt. We only wish to show them the wonderful success of this district, when we shall expect them to come there and fill up those mountain slopes with peach orchards.

"The 'yellows' are driving them away from the east, and in a few years we shall see thousands of them in that valuable peach belt."—*Jefferson City Tribune.*

A NEW AND USEFUL INVENTION.

It is with pride and pleasure that we refer to the Simplicity fruit evaporator, invented by S. A. Latimer, a prominent fruit-grower residing near this city. His machine is the result of many experiments and several years' study. The body of the evaporator is divided into two drying chambers by a center partition.

On either side of the drying chambers are hot-air flues with dampers arranged at convenient distances, which may be opened or closed at pleasure, to secure the best possible draft.

The fruit is placed on trays or small frames having wire-cloth bottoms. The trays are put in at a small door about three feet from the floor. They are gradually elevated by a crank through the front drying chamber. One tray rests upon another, and the entire tier of trays rest upon supporting ketches. When the trays arrive at the top of the machine, they are shifted by a simple device from the top of the front drying chamber into the trays in the rear chamber, through which they are gradually lowered by an easily operated device. The trays are taken out near the bottom of the rear drying chamber.

The furnace chamber consists of a box heating stove surrounded by a sheet-iron wall or box, which directs the currents of heated air into the dryer.

The success or failure of an evaporator depends largely upon the manner of directing and controlling the currents of heated air. In any process of evaporation the great desideratum is the application of intense heat; the best arrangement, and indeed the only correct one, is to subject the fruit to a continuous current of hot air.

In this respect Mr. Latimer's machine is a model of perfection, being constructed upon correct philosophic and scientific principles. Usually about one-third of the fruit crop goes to waste, which might

be saved by evaporating. We hope the day is not far distant when fruit-growers will not look with less unconcern upon this needless and sinful waste, than the thrifty farmer would upon the loss of one-third of his wheat crop for the lack of machinery.

This subject deserves more attention, and fruit-growers should acquaint themselves with the merits of Mr. Latimer's machine. It is simple in construction, having no cog-wheels, endless chains or expensive gearings; a child can operate it. It will, without doubt, be of inestimable value to farmers and fruit-growers everywhere.

CONCORD GRAPES.

Ephraim W. Bull, to whom belongs the honor of giving to the world one of the grapes that has now become a household word, lives in a small, old-fashioned cottage, one mile from the center of the village of Concord, on the Lexington road, and close by the old Hawthorne farm. It is a modest little place, yet nature has made the surroundings very beautiful.

Handsome shade trees, neatly trimmed hedges and vine-covered trellises help to make up a landscape that cannot be surpassed in artistic loveliness. Here the originator of the Concord grape lives almost the life of a hermit; and yet, when one knows the man, it seems a fitting place for one so endowed with a knowledge of nature.

It was just after dark on a recent evening when a reporter rapped upon the old-fashioned door of the little cottage, and the aged fruit-grower, with a hearty hand-grasp, led to a front room.

On the table were boxes containing dozens of varieties of grapes, while in the corner was a book-case filled with works on horticulture, and especially grape-culture.

Mr. Bull, when asked about his own life, replied :

I was born in Boston in 1806, in an old and historic house on Washington street, just opposite Bloomfield street. My father was Epaphrus Bull, a descendant of Nathaniel Bull, one of the early settlers of Hartford, Conn.

My boyhood days were spent in Boston, and I attended the public schools there. From my earliest boyhood I had a passion for books; although I left school at the age of eleven years, I had read from the Latin grammar, and had read the works of Shakspeare and other standard books in my father's library.

In 1834 my lungs showed symptoms of great weakness, and for three years I was under the weather. I was advised to get out of the influence of the east winds of the coast, and, as I had a brother living at Concord, at the Hawthorne house, I came here in 1837 and took possession of this little cottage.

When I came to Concord I found all the conditions favorable for grape culture—gently sloping warm soil and everything except length of season. I raised the Chaselas and Black Hamburg for my own use, making these species live and bear fruit by the closest care and protection.

We also had the Isabella, but with frost in June and September, it was difficult to ripen that variety in New England.

I did not know what to do, but wrote to William Prince, then a well-known nurseryman at Flushing, L. I., and told him to send any vines of good quality that were hardy and would ripen where Indian corn would grow.

He sent me twenty-five varieties, but out of all these only one flourished, the Clinton, a pretty grape and an abundant bearer, but sour in taste.

After giving much study and observation to the subject, it resolved itself into the following question: Why could we not grow the grape by planting seed? We had grapes with all the conditions, if we could improve the quality, to make a table grape.

I found a native grape. A neighbor had two boys who were great hunters and fishermen, and while going through a narrow pathway in the woods near the Concord river they found wild grapes in abundance.

It was in 1840 when this vine in the woods was called to my attention. I let the vine grow until 1843. In that year it bore an abundant crop of large, sweet grapes, ripening by the 22d of August. True, they were "foxy," but they were sweet.

I put these grapes whole into the ground, skin and all, at a depth of two inches, about the first of October, after they had thoroughly ripened, and covered the row with boards. This proved a great advantage, as the cut-worm and wire-worm came up to enjoy the sun on the boards, and thus I could destroy them.

I nursed these seedlings for six years, and in 1849 I was enabled to pick a bunch of black grapes on the 10th of September. I showed them to a neighbor, who tasted them and at once said: "Why, this is better than the Isabella."

I continued to improve it until 1853, when I showed it in Boston to the committee of the Massachusetts Horticultural society at their office on School street. I had previously shown it to Joseph Breck and to Mr. Buckminster of the Massachusetts Ploughman, both of whom gave it warm words of approval. T. Brown Hovey also expressed his opinion favorably as to its quality.

I took a basket of the fruit to the committee rooms, put it quietly on the table and went out. Returning in an hour or two, I found the members of the committee in consultation over the contents of the basket. "Is it hardy?" I was asked. "Yes, raised from wild stock," was my reply.

Others had tried to improve wild grapes without success, but I do not find that they had tried to do so from the seedling. I met with much prejudice and rivalry, but I was content to let the grape make its own reputation.

The grape was put upon the market in 1854, and now it is growing in every section of the country and in many foreign countries. In France it is growing in favor every year.

I have hundreds of letters from all over the world asking for information, and many requests for cuttings from the original vine. Visitors come every day who desire to see the parent vine of this wonderful grape.

From the Concord I have raised other seedlings—the Cottage, a black grape, the Una, a white variety, the Esther, another fine white grape, and others—and I still continue to plant seedlings, which are given care and cultivation.

Such is the story of the world-famous Concord grape and its originator.

Mr. Bull is a well-preserved man, with faculties alert. He has written much information on grape-culture, which he hopes to put in shape for publication before the close of his busy life.

[NOTE BY THE ED.—We insert the above for the purpose of placing on record what we believe to be the true history of the grape. We well remember the time of its introduction and the comments it caused for and against it. The introduction of the Concord marked a new era in the cultivation of the native grape, or such varieties as will stand the climate of this country, and we certainly think Mr. Bull worthy of the greatest monument that could be raised, for to his foresight are we indebted for the improvement of this fruit.]—*Hort. Art Journal*.

A FLOWER-GIRT THEATER.

Inherent lovers of the artistic and beautiful, it is not strange that the French are fond of flowers, and they add to the attractions of the finest city in the world by a lavish use of flowers and verdure. We never see a beautiful garden without being transported in imagination to La Belle France.

One of the grandest and most beautiful examples of floral decorations we remember was the open air theater of the Pre Catelan, a garden in the midst of the Bois de Boulogne, intended for open air entertainments of a refined and aristocratic kind.

But to our theater, the entrance to which was through a short avenue of verdure, hollyhocks, dahlias and gladioli, where the ticket-sellers peered out through masses of roses. Its plan was circular, and the parquet represented by a graveled space, well furnished with iron garden chairs. Running around this was a band of verdure, edged with a profusion of verbenas and petunias, while beyond was a gravel path in which were two rows of chairs. This might be called the family circle. A bed of other low-growing flowers and sod separated a higher tier of gravel path and chairs, and to the rear of all there ran a line of rustic arbors connected with galleries of rustic cedar, almost covered with climbing plants, among which roses were the most abundant.

The curtain or drop scene, which was dropped instead of being raised to reveal the "stage," was a magnificent screen, covered with

an exquisite design in cut flowers, all natural. When this work of art sunk from view there appeared an exquisite bit of landscape gardening, all real, no canvas castles, or cottages in the rear, but a wood of young trees and shrubs with bits of lawn before them, clumps of flowers at the sides, and in front a space of hard gravel, necessary for the performance, which was all terpsichorean in character.

To sit in the center of this exquisitely beautiful *al fresco* theater, with the rising banks of flowers all around, the pure sky of beautiful France above, was as near a realization of a dream of paradise as we had yet reached.

T. L. R.

"THEY ARE COMING TO MISSOURI."

[Read by Miss ZELLA GILBERT, at the Fulton County, Ark , Horticultural Society meeting July 11, 1891.]

They are coming from the deserts
Of the dim and dusty East,
Where to raise a stunted turnip
Is the prospect of a feast ;
Where the farms are made with gravel
And they plow with dynamite,
Where the festive chattel mortgage
Sings its dirges day and night ;
They are coming in their wagons,
They are coming on the train ;
They are coming from the regions
Where they struggle long in vain ;
They are coming from the cabin,
They are coming from the hall ;
They are coming to (South) Missouri,
Where there's plenty for them all.

Where you needn't dig potatoes
With a saber and a dirk,
Where when rain is badly needed,
Then the rain gets in its work ;
Where the rivers moan and murmur
On their journey to the sea,
Where the breezes tackle corn-stalks
Big as fence-posts on the lea ;
Where the savage lately wandered
In his search for human hair,
Where his hoarse and howling war cry
Floated on the summer air,
Where a hundred braves would answer
To the chieftain's battle call ;
They are coming to (South) Missouri
Where there's plenty for them all.

Where the savage used to wander,
Yearning for a crop of hair,
Now the farmer takes his porker
To the nearest county fair ;
And the corn is dally growing,
Where the greasy wigwams stood ;
Where he burned the wailing captive,
Now the poultry scratch for food ;
And the people who are coming
To this pleasantest of climes,
Show a happy knack of keeping
With the progress of the times.
They will find a country beaming
From the spring time to the fall,
When they land in (South) Missouri,
Where there's plenty for them all.

HOW TO MARKET YOUR FRUITS.

[Read at Fulton County (Ark.) Horticultural meeting.]

It is one thing to grow fruit and another thing to market and sell it for remunerative prices. From my observation, I don't believe there is one farmer in fifty in this part of our state or North Arkansas that brings apples or peaches to Thayer or Mammoth Springs in such condition as will enable a dealer to buy and ship to any market, and realize anything like its real value, had it been properly handled. The loss resulting from this careless, slipshod way of handling your fruit costs you many hundreds of dollars yearly. I would urge you to pick and handle your fruit more carefully, and market only your choicest fruit. Not long ago I saw a farmer gathering apples for market. He had a pole ten feet long, and was knocking and threshing the limbs and fruit right and left, and it only took him about ten minutes to get that many bushels of apples on the ground, every apple being bruised before he had them measured up. He then picked them up, put them into grain sacks, threw them into the rear end of the wagon over the hind axle, put two dressed hogs in center of wagon, and his eggs over front axle. We follow him to town. He gets twenty cents a bushel for his apples, and his eggs, half of them are broken. Had he picked his apples, carefully assorted them, and only marketed his perfect, large specimens in new, clean packages, hauled to town on a spring wagon, or in a bed three-fourths full of hay or straw, he would have received four times as much money for them as he did, and have all the culls for cider, drying, or to feed to his hogs. This year we have a full crop of peaches

and no sale for them. Why is it? In the first place, you have failed to either cultivate, prune or thin your fruit. The trees have four to six times as many peaches on the tree as the tree is able to properly mature. The full vigor of the tree nearly all goes to the pit. Consequently we have two bushels of pits to four of fruit. I fear that many would, if they had large peaches, ruin them before they got to market by bruising. A farmer recently brought in a load of peaches, and his honest and simple statement in regard to the quality of his fruit covers the ground pretty thoroughly. He said: "They haint big uns, nor they haint soft uns, but if you will keep 'em long enough they'll be soft as anybody's peaches. I'd keep 'em myself till they get soft, but if I did I couldn't handle 'em."

If I could impress upon your minds the importance of careful handling of your fruit, and get you to adopt the method of marketing nothing but fine, perfect and large specimens of both apples and peaches, I should be amply repaid for being present with you to-day. It is all nice enough to attend our meetings, but after listening to our papers and discussions it is your duty to take the thoughts brought out to your homes, study and weigh each carefully, and hang fast and put into practice all that is good, discarding all that is not good and practicable. I hope that some of our friends here to-day will be well paid for their time in attending this meeting. Give your name to our Secretary, become a working member of this Society, and thereby become a member of our State Horticultural society, receiving yearly free a bound copy of the proceedings of all their meetings, a book worth ten times your yearly dues to every lover of fruit or flowers. You should take good horticultural papers. Colman's "Rural World," "Fruit-Growers' Journal" and "Green's Fruit-Grower" are all good papers. Thanking you again for your presence here, I am yours truly,

S. W. GILBERT.

THAYER, MO., July 11.

THE FLAT BASKET.

By H. H. BATTLES.

The flat basket makes a very pretty way to send flowers, and especially so if they are fine, long-stemmed roses, that they may be put in water as soon as they are received.

The dark roses are specimens of that magnificent rose, the Ulrich Brunner, whose admirers are not far wrong when they say that for winter forcing it is the finest rose in cultivation.

The light roses are Mrs. John Laing and Mme. Gabriel Luizet, who are rivals worthy of each other. Those devoted to the Laing contend that it is more symmetrical when it opens, and that it has not the thorns of the Luizet. But there is a certain grace about the latter when it does unfold its petals that the Laing does not possess, and, too, under certain conditions it has a fire that is peculiarly its own.

Speaking of roses in this light makes me think of other beautiful ones. Who has seen the Anna de Diesbach in her greatest beauty, and felt that she did not deserve the honor of being called "the glory of Paris?" Baroness Rothschild—I wish that all titles were as worthily bestowed and maintained with the same dignity. Captain Christy—I should like to make him a general. General Jacqueminot should be made a field marshal. Paul Neron is big enough to know better. Her Majesty "the Queen, God bless her," I guess is more admired in England than here. American Beauty—"When you're good you're very, very good, and when you're bad you're horrid." Marechal Niel is always welcome. Souvenir de Wooten, named after the home of Mr. George W. Childs, one of the finest in the United States, situated at Bryn Mawr, Pennsylvania, about ten miles from Philadelphia. Mr. Childs is President of the Pennsylvania Horticultural society. His gardens and plants are presided over by Mr. John Hughes. La France—I think the popularity of this beautiful rose is on the wane. Madame Hoste and Duchess of Albany have so recently made their debut that it is hardly fair to criticise, both having many good qualities. The latter, however, is very fine with us now, holding its shape and color, and lasting much better during these warm days than the old favorite, La France.

The Bon Silene, Isabella Sprunt, Safrano and Cornelia Cook we remember with great pleasure, but we have something very much better in their places, such as Papa Gontier, Madame Hoste, Sunset and Bride. Speaking of the Bride reminds us of her sister, Catherine Mermet, who deserves all the praise that is bestowed upon her. Still, she will have to look to her laurels when her younger sister, Waban, makes her debut. I have seen her, and assure you she is very beautiful. Niphetos, Souvenir d'un Ami, and Souvenir de la Malmaison, I wish we might see more of, but, like the grand old Marechal Niel, they are put on the shelf by many, and marked unprofitable. The same is said of moss roses. Somebody is to blame for this; either the grower

has not the courage to grow or the dealer brains enough to sell this beautiful rose. If properly handled, there should be a good demand for these roses.

We started by saying something about arranging a basket of flowers, but got off the track.—*Am. Florist.*

A FARMER'S SHRUBBERY.

E. P. POWELL, Oneida Co., N. Y.

Don't make a mistake about your flowers and mix things too much. If you wish to enjoy nature, do as nature does; have a nook for flowering plants, and have your shrubs in groups. If you can, plant a lawn to shrubs alone. What I mean by a lawn is what folks used to call a yard, only a lawn is a space inside a drive or drives, or brook, or a separate slope or swale hedged in, instead of being enclosed by fences.

Don't have a fence if you can help it. My shrubbery is enclosed by a drive that divides and goes about it, and then runs together again about the house. It is just whatever came inside that driveway, above half an acre. Some would find it easier to plant their shrubs on one side or a back corner of the home lot, or down a swale or over a knoll. When the shrubs are young they will not make much show, and may have flower beds temporarily scattered about. They should also include some superfluous specimens that can be dug out as the others get larger.

Don't begin by leveling, or by grading, or by terracing. Nothing looks worse in the country than a smoothed-off little bit of a lawn, which looks as if it had been picked up in the city at auction and dropped down by your door. Keep all your property equally clean and pleasant, and not have one yard or lawn fussed over and worked on constantly while the rest of your farm looks bewitched with brush, and stones, and stumps, and general neglect.

About shrubs, begin by collecting those that grow wild in your own section. There are some very fine native shrubs in every section of the United States. Hereabouts I can yet find Wild Cherries, Sumach, Leatherwood, Witch Hazel, Hopple Bush, Berberries, Dogwoods, etc., all very fine. Horatio Seymour insisted that the Elder bush was one of the finest bushes in existence. He was right, when it is well grown. Add always your native evergreen bushes.

Next, collect such native trees as will bear to be grown as shrubs or bushes. Do you know what I mean? Most lawn planters do not know that Tulip trees, Lindens, Acacias, Beeches, Catalpas, will bear to be cut back to the ground, so that they will shoot out a dozen stems instead of one trunk. Grown in this manner with annual cutting back, they make delightful bushes, and many of them bloom profusely.

Thirdly, collect from your neighbors the old-fashioned bushes such as Syringas (Mock Orange), Lilacs, Spiræas, etc. Then you can begin to purchase. Now I will give you a list of what I think the finest shrubs that can be obtained anywhere, and grown in our Northern states: Send first of all for a half dozen catalogues. Then select what you desire, and pay honest prices and get what you buy. But if any one sends a catalogue that paints the town red with extravagance, don't trust him.

1. The finest shrub in existence is an evergreen native, the Mahonia. It is a wonder, fine all winter for cutting; blossoming in great golden balls in May; the young foliage coming out rich crimson, turning to green. But this shrub must be planted out of sight of winter sun, in a northeast angle of the house, or it must be covered with evergreen boughs or litter.

2. One of the most useful of all shrubs is the Bush Honeysuckle in several varieties. Some of them are originally from China, others are native. The red, pink and white are desirable; entirely hardy, rapid growers, immensely profuse in bloom, and are easily made to form superb hedges.

3. Of the Lilacs every one should have the common white and purple, the Chinese, the Persian White and Persian Purple, the Rothmagensis and Josikea. There are easily obtainable thirty or forty sorts.

4. Berberry: The sort called *Vulgaris* is the finest. It is a native of England, but is now often found in our woods. It is not only fine in flower, but superb in fruit all winter. It is the glory of November and December. Give it moist soil on a cool spot.

5. Several of the Dogwoods are grand. The *Cornus Florida* is a small tree, and is hardy up to Southern New York. Its magnificent clusters of bloom are unequaled in small trees. The Red-barked Dogwood has its bark green till the leaves fall, after which all winter the bark is vivid carmine red. It spreads into great bunches in damp spots and glows like a fire on the snow.

6. The Japan Quinces are of three colors in blossom. The flowers are very attractive, covering the whole bush with scarlet or pink or white. They flower in May.

7. The Weigelas are superb. You cannot get anything finer than these three sorts—Candida, white; Rosea, rose-colored, and the superb variegated-leaved variety. Flowers are large, profuse, lovely. They flower after the Lilacs.

8. Rose of Sharon or Althea, or as it is sometimes called, Hibiscus: These are by all odds the finest, longest blooming shrubs, continuing for two months. They are superb and in many colors. The Variegated-leaved Althea never opens its buds, but the foliage is fine. These bushes are delicate when young, but if protected for three years will prove very able to care for themselves.

9. A rare but excellent shrub is *Exochorda grandiflora*. It blossoms in May all over in large, white flowers. Don't fail to get it.

10. The best *Hydrangea* is *paniculata*. If grown to a single stalk in good soil, it gets to be ten feet high and as many through, and in August will come out on the end of every twig with flower panicles as big as a baby's head. It is truly noble.

11. Mock Oranges: Get all the sorts you can. It is a delicious flower, always white, sometimes double, sometimes single.

12. The best purple-leaved shrub is *Prunus Pissardi*, a plum that bears small flowers and fruit, but the leaves are exquisite. The next best colored shrub is the purple-leaved Filbert.

13. For a very early bush the Yellow-flowering Currant or *Ribes* is excellent. It blooms very soon after snow, and is covered with yellow, high-perfumed flowers.

14. Of the *Spireas*, select *Callosa* with pink flowers; *Prunifolia* covered with rosettes of white; very early; *Reeversi*, and as many more as you can afford. They are fine, and some sort is always in bloom.

15. The Snowball (*Viburnum*), also High-bush Cranberry, a single flowering sort, and the new Japan *Viburnum*, all grand.

16. The magnificent bushy Magnolias: Two I see that I have omitted that ought to be inserted, the Double Scarlet Plum and the Fringe tree, both magnificent.—*Popular Gardening*.

HOW TO GROW MUSHROOMS IN THE FIELDS.

Most people like mushrooms, but I do not meet with many people who know how to grow them. I allude to those grown in the open fields and parks. I have picked a basketful of mushrooms of all sizes each day in a field of about eight acres of old pasture, on which about

ten years ago I applied in the month of February about three cwt. of ordinary rough salt to the acre, and soon after dibbled in by means of a short spade, bits of mushrooms spawn as big as a bean all over the field. This I did my self by degrees during a space of a month or more, and the result has been that on this field I have had a grand lot of mushrooms every year, from about May until September. I have some salt put on this field more or less every year since I first did it, and shall continue to do so, as the dressing not only assists in the production of mushrooms, but it also improves the quality of the grass, which is grazed by cattle and horses, and sometimes by sheep alternately. —*Land and Water.*

ORIGIN OF MEN OF GENIUS.

Christopher Columbus was the son of a weaver, and also a weaver himself. Claude Lorraine was bred a pastry-cook. Cervantes was a common soldier. Homer was the son of a farmer. Demosthenes was the son of a cutler; Oliver Cromwell was the son of a brewer. Howard was an apprentice to a grocer. Franklin was a journeyman printer and the son of a tallow-chandler and soap-boiler. Daniel Defoe was a hosier and son of a butcher; Cardinal Wolsey the son of a butcher. Lucien was the son of a maker of statuary. Virgil was the son of a porter. Horace was the son of a shop-keeper. Shakspeare was the son of a wool-stapler. Milton was the son of a money-scrivener. Pope was the son of a merchant. Robert Burns was the son of a plowman in Ayrshire.

MISSOURI'S FRUIT CROP FOR 1891.

LEVI CHUBBUCK, *Secretary State Board of Agriculture* :

In answer to your request, I submit the following report on the fruit crop of the State for 1891 :

SMALL FRUITS.

Opening with a very wet season during the berry season, the supply was unprecedentedly large, and of course low prices were the result—not so much, perhaps, on account of the large supply, but because the wet weather caused them to be so soft that they would not bear handling well. Ofttimes the strawberries would mould in twenty-four hours, and be unfit for use.

I suppose we are obliged to work for less profit than formerly, and we must be satisfied with it. Very many of our fruit-growers made

the berry crop pay remarkably well, however, and they are inclined not to increase the planting, but to grow better berries and get better prices.

I wish I might give you statistics on all points, but that is impossible; suffice it to say that the berry crop ran up into millions of dollars, and better berries were never seen. I think we should drop the softer varieties and grow firm, good shipping varieties, and no others. In many parts of the State they are preparing to can the surplus berry crop and thus relieve the market. Many hundreds of thousands of cans were put up last summer, and my prediction is that ere long we will stop this shipment of so much canned fruit from the East.

THE CHERRY CROP,

Especially the Duke and Morello varieties, were a very paying crop indeed, and this very palatable fruit is coming into more general use, as it should. There is scarcely a hill-top in all the State but can grow the Morello cherry to perfection, and no farmer should be satisfied with the old Morello cherry when he can just as easily have the E. Richmond, English Morello, Ostheim, etc.

THE GRAPE CROP

Was very excellent indeed, in all parts of the State where "rot" did not trouble the vines. The experiment of the Government in destroying the fungus growth has been so well carried on by a Missourian that he writes: "I have no fear now of the grape-rot, for the spraying with the Bordeaux mixture has completely eradicated every bit of rot from my vineyard. I now can grow all varieties to perfection, and I say this positively, knowing the success I have had the last three years in experimenting with the mixture."

The grape crop now annually amounts to many hundreds of thousands of dollars, and the time is near at hand when every one can eat grapes, and the best of grapes, too.

THE PLUM CROP

Is a growing one also, and of the Wild Goose varieties we now have a number which are proving valuable to the grower and the dealer.

The crop was a full one only in places, and not general. A late frost, March 1, injured them very much in some localities.

THE PEAR CROP

And pear growing is confined to special locations. About St. Louis and on the loess formation, they seem to be more at home than elsewhere in the State, and wherever they are grown they are a most profit-

able crop indeed. Pears, selling now from \$5.00 to \$6.50 per barrel, are certainly an incentive to the growers of this luscious fruit. Day by day we are finding choice locations for the pear where the dreaded blight seems not to do so much damage.

The crop was a good one.

THE PEACH CROP

Was an extraordinary one, wherever there were good orchards left. In many parts of the State peach-growing is about given up, but in the State of Missouri there are thousands of young trees bearing the finest peaches that ever grew in the whole United States. The peach crop was a very valuable one, and brought many hundreds of thousands of dollars to the State.

THE APPLE CROP

Is a good one on young orchards, and on orchards where they were not too full last year. Growing rapidly in importance every year, it will not be long before the apple crop will be worth more to the State than any other one crop.

Prices, of course, will not be high this year on account of the great supply of other fruits; yet I am sure good apples will bring 50 cents per bushel, and not long ere they will be worth \$2.00 per barrel on board of the cars at all our small towns.

One year ago I made the statement that the fruit crop of that year brought \$10,000,000, and before the year was out I had hundreds of people on my side who were on the other side in the beginning.

The fruit crop this year will bring much more than \$10,000,000 to the fruit-growers of the State, and there never was a time when our fruit-growers were in as good spirits as now, or had as much money as now.

The fruit interests have grown at least 15 per cent the last year, and it will not be many years before Missouri's fruit crop will rival that of any other State.

Correct planting, careful cultivation, judicious marketing, will give profitable results every time.

Westport, Mo.

L. A. GOODMAN,
Secretary State Horticultural Society.

WORLD'S FAIR FRUITS.

PREPARATIONS MAKING FOR A MARVELOUS EXHIBIT.

Address of Hon. J. M. SAMUELS, Chief of Horticulture, delivered before the Michigan State Horticultural society.

As you are aware, my appointment has recently been made. Upon being confirmed, I found the plans of the Horticultural hall had been decided upon, contracts given for most of the work for the building, and the location properly determined, but nothing more. Out-door space for trees and plants had not been considered, and in the general scramble for additional space, by the heads of the different departments, every available foot of land had been appropriated, except a small area between the building and the lagoon. This seemed discouraging for a beginning, and I came to the conclusion at once that it would be necessary to act with promptness and vigor before plans had developed too far to admit of being changed.

By persistent effort we have succeeded in having assigned to the department all of a beautiful elevated island, containing fifteen acres, and around which are clustered most of the great buildings of the Exposition. The view, from every part of this island, will be the grandest on the grounds, and in some respects will not be equaled in the world. Adjacent or near to the horticultural building, an additional ten acres have been secured, making about twenty-five acres of out-door space altogether. The island, upon which has been spread the black soil removed from all the building sites, mixed with a liberal supply of fertilizing material, will be used for an exhibit of roses, rhododendrons, azaleas, herbaceous plants, and a general nursery display. The planting immediately in front of the building will consist of echeverias and other bedding plants, arranged in raised beds and made to harmonize with the ornamental frieze which extends all along the front of the building. The beds will probably be illuminated with 30,000 or 40,000 incandescent electric lights, requiring 1,000-horsepower to operate them. And these lamps will show the complete outlines of every bed, and be placed under foliage, and colored in a way to bring out the most spectacular effects. They will be operated to show portions of the beds at one time, or different parts in rapid succession, and thus present an attractive panorama or kaleidoscope. Other parts of the outside grounds will be illuminated in various ways. The horticultural building is the finest ever erected for a fruit and plant exhibi-

tion. It is 1,000 feet long by an extreme width of 237 feet. As you will notice from the engraving, it has a central glass dome, connected by front and rear curtains with two beautiful end pavilions, thus forming two interior courts, each 89 feet by 287 feet.

The roof of the front curtains will be glass, and they are intended for the tender plant exhibit. The rear curtains have opaque roofs, except sufficient glass to give an abundance of light for the fruit display. For heating the dome alone by steam it will take 10 miles of 1½ inch pipe, besides an additional amount for the front curtains. There are 59,631 square feet more of floor space in the hall than in the combined horticultural buildings at the Centennial, New Orleans, and Paris.

The dome is 187 feet in diameter and 113 feet high on the inside, and to overcome the dwarfing effect on plants that would evidently be produced by its immensity, it is intended to construct a miniature mountain under its center 40 feet high and 70 feet in diameter, and upon the sides and top of this artificial rock work to set the largest specimens of palms, bamboos, tree ferns, giant cacti, etc. Some grand examples 40 feet in height have been donated for this purpose. Among this mass of exquisite foliage will be represented, by the use of incandescent electric lights, the forms and tints in colored glass of flowers rarely seen in this country. Over its sides will fall in translucent sheets and ripples the water for a beautiful cascade, while the interior will form a cave, from the crystal side of which will be reflected the brilliant lights of thirty electric arc lamps of 2,000 candle power each. In recesses and for special effects, incandescent lights will be placed within the cave, in order to observe the effects and to test the endurance of different species under such conditions. It is hoped to arrive at some definite and valuable conclusions by this experiment.

In one of the courts of the buildings basins will be made for exhibiting *Victoria Regia*, *nymphaea*, and other rare aquatic plants. Incandescent lamps will be arranged under the water to show effects not heretofore attempted. In the other court California and Florida will compete for honors with bearing orange groves. The former State will illustrate the manner of irrigating their orchards, and the latter will intersperse bananas, pine-apples, and other semi-tropical plants often cultivated in connection with the groves of that State.

The balance of the building will be devoted to collections of orchards, crotons, cycads, dracænas, aroids, and rare plants from every part of the world, and to the fruit display.

Space for at least 60,000 plates of fruit will be reserved for the grand display which will take place in September. In this exhibit, it is intended to keep out of the beaten paths of former expositions,

and adopt some new methods. Long tables, with straight rows of fruit, are too monotonous and will be avoided. It is intended to have the receptacles for the fruit made in artistic forms of papier-mache, and supported in unique ways. The exhibit will be embellished with flowers and plants and made more attractive by miniature representations of orchards, methods of cultivating, irrigating, etc., in mountains and on plains, in tropical and temperate climates. Wax models of fruits out of season, and of those too tender to transport from distant lands, will illustrate, in form and color at least, specimens unfamiliar to most of the visitors who will attend the Exposition.

Experiments will be made with glass cases through which condensing refrigerator pipes will be run, and the temperature kept at a proper degree to preserve, as long as possible, berries and other perishable fruits. The difficulty in the successful operation of this plan may be the condensation of moisture on the glass sufficiently to obscure the view. It is said, however, this can be obviated by making the glasses double and leaving some space between them.

In one of the pavilions the general seed and horticultural appliances display will take place; in the other pavilion the viticultural exhibit will be confined. These will be separated from the other displays as completely as if they were in a separate building.

The classification is very elaborate, and embraces almost everything of interest to horticulturists. Here may be seen fruits and plants from every part of the world, the best methods of heating and ventilating green-houses; grafting, pruning and spraying trees and vines; machinery for gathering and marketing fruits, and for assorting, cleaning, arranging, labeling and testing the vitality of seeds.

It would take too much of your valuable time to give in detail the full scope of the department.

Mr. John Thorpe, of the Floricultural bureau, is now in the East, and is instructed to visit every prominent conservatory and make a complete list of all the fine plants that will be donated, loaned or exhibited for competition, with a view to having one or more men start, about the beginning of the year, to the West Indies and Central and South America, to collect large specimens that cannot be secured in this country. Directions for collecting, packing and forwarding plants from foreign countries have been translated into several languages and widely distributed.

Many intending exhibitors of fruits and plants, in this and foreign countries, have made application for space, or, with a view thereto, are corresponding with the department.

The management, with the aid of heads of the other departments, have strenuously opposed all cash premiums, and it has, therefore, been more difficult to convince the authorities that an appropriation was necessary for that purpose. In my report to the committee on awards of the national commission, and the agricultural committee of the local directory, I made the following statement :

“Believing it will result in economy to the Exposition management, besides being an act of justice to a certain class of exhibitors, and also create a superior exhibit, I would recommend that an appropriation of \$45,000 be devoted to cash premiums. No manufacturer of any horticultural appliance, or any person or corporation who could be greatly benefited from advertising a business, should receive a cash premium. On the other hand, the exhibitor of fruits and plants, who makes collections at great cost, pays freight and express charges, is protected by no patents, and receives no special benefit, and finally loses everything at the close of the Exposition, should be reimbursed for some of his outlay. As a prize that would be offered amounts to a small per cent of the value of the article exhibited, it seems to me it would be a wise policy to induce the owners of meritorious specimens to offer them for competition, rather than be compelled to purchase for account of the Exposition. Some of the rarest and most beautiful plants could not be bought or borrowed, and the only way in which they could be secured would be to offer competitive prizes.”

Both committees and Director-General Davis have recommended the appropriation, which practically insures its passage. This amount will be sufficient to secure a magnificent display.

NEW FRUIT PRESERVATIVE.

The following method of preserving fruit was given to us by the Secretary of the World's Fair Commission for New Mexico. It will be used in preserving the immense fruit exhibit of that State in '93. By its use fruit can be preserved intact, without the loss of color, form or taste, for an indefinite period :

Take any good water-tight barrel, closed at both ends. Insert a faucet at the bottom, and on one side saw an opening. Let the lower part of the opening fit an inch board ; the upper part a saucer. Insert a board about eight inches long, so that it extends at least six inches into the barrel. A cleat should be nailed across the outer end to prevent its slipping into the barrel. Fill the barrel to the level of the open-

ing with water. Now place a saucer two-thirds full of ordinary yellow sulphur on the board. Sprinkle over it a little common potassium chlorate. Light the sulphur and push it along the board till it is inside the barrel. Then cover the barrel closely with an old blanket or quilt, winding it around so as to prevent the escape of the sulphur fumes. Repeat this burning several times, till the water is strongly impregnated with sulphur. Then draw off the water into glass jars. Add an ounce or two of powdered alum to each gallon jar. The preparation is now ready for any fruit, and will preserve it indefinitely, though to obtain the best results sound fruit should be used.

Another simpler, though less satisfactory method, recommended by W. A. Bowen, of San Antonio, Texas, is to place the fruit in a brine made by boiling salt in water.

The guardians of public pleasure grounds should bear in mind that these resorts are for the education of the public; that they hold their office not to minister to unlearned and vitiated taste, but to appeal to the finer and higher perceptions which may be latent in the most unlikely quarters. The multitude grope in the dark, longing for light. Let that light be true, and not false—a guide, and not a concession; a beacon, not a mirror.

It is wise to show people what can be done with simple and easily accessible material; with perennial plants; with beautiful, but not uncommon annuals; with shrubbery that can be cultivated in almost any garden; with hardy plants that may be found blooming early and late, when exotics must be housed, and tender things wizen in a chilly wind. Rare things, too, there may be, but let a part of every public ground serve as an example to all who love gardens. There are millions of people who cannot afford a landscape gardener, but would be grateful for a hint of how to manage their own little grounds in a way that would be pleasing without being costly, and that would be reasonably permanent. Not until public gardeners realize that they have a mission to perform will they truly merit their high office, for it is a high office to develop taste, to define beauty, and to indicate dignity and grace in the arrangement of trees and shrubs and flowers.—*Garden and Forest.*

COLOR HARMONY AMONG FLOWERS.

F. SCHUYLER MATHEWS.

There is a great deal of meaning in the word harmony; it means first of all things—peace; everything outside of and in contrast to harmony simply means—war and distraction. It is absurd for us to believe that flowers are exempt from any elements which will produce dissonance and confusion because they are in themselves perfectly beautiful.

There is a story told of of a certain very pretty Western girl, who, when she heard that a Baltimore belle would be present at the ball she expected to attend, declared her intention of remaining away. Perhaps the young lady was right; it might have happened that both she and her rival were blondes or brunettes; in either case the comparison which would be unavoidable might not be in her favor. Thus it is with our flowers: the most beautiful of them are quite likely to damage each other by mere contact. There are some brilliant and showy scarlet geraniums; they are lovely among the greens of the lawn, but pick a cluster and place it beside any one of the pink varieties and we have instant discord—war! But here is a copper birch beside us; we will pick a slender branch or two and place them with our scarlet geraniums in yonder dull olive green vase standing in the porch; the result is a harmony of color which will rest as well as please our eyes. We must remember too that scarlet is a color which works violently with its surroundings unless they be of the right sort. And although the copper-birch leaf and the geranium flower make a queer couple for a match, at least in point of color, they agree with one another perfectly.

We will have an opportunity now in the early summer of disposing in graceful groups some of these beautiful toned hydrangeas, say for a garden party. Here are some specimens of a decided pink, there are some of a purplish tint, yonder are some perfectly blue ones, and occasionally we see some half-developed green-white ones; if we combine a good mass of all these colors and arrange them skillfully, so they run together somewhat, we may produce the effect of a lovely bank of graduated color. Beginning at the bottom with our green-white, next taking a number of the palest blue, next the deep blue, and after these purplish blue, then slipping in a pot of the purple color, and finally topping all with our pink ones, we will gain an effect suggestive of the

rainbow, but delicate of color; the blue thus finally running into the pink gives us a very lovely cool effect for a warm summer afternoon.

We will take it for granted that the house is colonial, and its decorations are almost entirely in gold and ivories and creamy yellows. Here is our opportunity for the use of any and all the blue flowers we can obtain. If violets are not gone we may use them in all shades, on the tables, indoors and for bouquets for the ladies, always remembering that the green leaf must not be thrown aside, nor the bit of violet blue ribbon of pale tint forgotten to tie about the stems. There are forget-me-nots too which we can use plentifully in beds where we wish any, and in the filling of any little white vases we may spy, waiting among the bric-a-brac to make themselves useful. Now we can use what white roses we wish, Brides, Niphotos and even the good old-fashioned Baltimore Belle. We may even use the Madam Cusin, but we would best leave all "jacks" and all pink and yellow roses out of consideration; we do not need them, and we should in every way emphasize our blue and white combinations, leaving all yellow effects to the house itself. In a word, produce in blue running toward the pink, in white and in cream colored flowers all our decorative work. Perhaps the creamy yellow buttercup pink is none too yellow for our purpose, and will combine well with any of our pale blue flowers. We will try the experiment any way, and if there are any pieces of blue and white china about, we will fill them with the pinks, and perhaps add a blue flower or two. There is plenty of the blue iris now, and we may employ it in any decoration scheme that gives us a wall for back-ground, not forgetting the beautiful green leaves. I prefer myself to see the iris placed in white or pale green glass vases, so one may see the water, which in nature is its constant company. There are pansies now, blue as violets, and others of a pale purplish tint, which we ought to use where we need an expanse of low or flat decoration. Pansies never ought to be mixed indiscriminately; there is a strong temptation to do this on account of the great variety of color they possess. But we would better sort them out, keeping the bronze and yellow together and the blue and pale purple side by side. The white ones are very dainty and will always mix well with any of the pale toned varieties. But when we come to the dark purple, black and dark blue violet varieties, we must be careful to employ them sparingly, perhaps only for strong contrasts.

It is an open question whether more than three varieties of a flower can ever properly be placed side by side, and no principle of good taste broken. Our safest combinations of flower color always run inside of three tones. When we use the broad and effective peony for deco-

ration, we ought not to put more than two varieties together; try more and see the result. Your third variety, nine chances in ten, will be so much "waste powder and shot" flying over people's heads. A great bunch of white peonies in a bowl-shaped vase is an effective bit of decoration, especially if the bowl is yellow or pale blue; add to this group a single one of the pink or crimson variety, and your decoration scheme is ruined; there is an element of discord introduced, and the harmony is gone.

When it comes to combinations of flowers possessing intense hues, we are on particularly dangerous ground. The safest method of treating the "jack" rose, the crimson peony, the black pansy, the scarlet poppy and the bright-hued gloxiana is—to let them alone: that is, do all you can with them in a group of their own, use white flowers for the sake of sharp contrast if you will, but do not let us attempt any color combinations here; already we have all the color necessary, and an added blue, yellow, orange or pink will surely result in chaos. We must remember just here that "enough is as good as a feast," and the time was when baskets of flowers containing from ten to fifteen different kinds all jumbled together so no clear impression of the whole was possible, pleased people. We do not care any more for samples of flower gardens; we want a basket of pinks or a garland of red roses or a jar of golden daffodils—something in fact that will convey to our heads and hearts one simple and perfectly beautiful idea.

NORTH AMERICAN ASSOCIATION.

SPRAYING AND BEES.

Dr. J. A. Lintner, State Entomologist, was present at one session to obtain facts as to injury to bees from arsenical poisons used in spraying fruit-trees. He said that as yet he did not believe there was any danger, but he has always advised that the spraying be done after the blossoms had fallen. With some ten insects, however, as the curculio, it is necessary to spray before the blossoms appear, with the first unfolding of the leaves. At the Washington meeting of entomologists, his views on this subject were sustained; there is need, however, of careful experiments, perhaps by some of our stations. He would like cases of injury given, if any were known.

C. P. Dadant, Illinois—Mr. J. G. Smith, of Canton, Ill., lost 50 colonies through spraying. All his neighbors sprayed heavily. This led to the introduction of a bill into the Legislature to regulate the matter, which, however, was not passed.

Dr. Lintner—Were the bees and honey examined for presence of arsenic ?

Mr. Dadant—I do not know that they were.

A member—Two orchards near Cayuga Lake, N. Y., were sprayed when in blossom ; 72 swarms were killed.

Dr. Lintner—In such a case bees and comb should be sent to an expert in chemical analysis and tested for arsenical poison. If arsenic is found, then we have a case against spraying.

Mr. Dadant—I object to comb examination. We cannot tell from what trees the bees may have come. I should like to ask if any one ever heard of bees dying in May before spraying was practiced ?

Mr. Doolittle—A vital point. Such dying was not known before.

A member—A neighbor sprayed his orchard in blossom and reported quantities of dead bees under the trees.

R. McKnight, Ontario—After putting Paris green on patch of potatoes I found 26 dead bees. As bees go out early in the morning to these and other plants to collect water from the leaves, I believe there is more danger in this quarter than from spraying.

Mr. Knickerbocker—The trouble comes from over-spraying and using too heavy doses.

S. Corneil, Ont.—The instructions of entomologists have not been followed, and people have sprayed largely in blossom time. My neighbors have done so generally.

A member said that after spraying time many queen cells did not hatch, and he laid it to the spraying.

Pres. Elwood—Prof. Cook has fed bees the same arsenical solution that is used in spraying, and they died.

Dr. Lintner—While there is no doubt the larvæ of most insects can then be killed, it is different with the full-grown insect. Some, like the rose-bug, we cannot kill with the strongest solution. Yet we are constantly weakening our solutions. For the curculio we use 2 pounds to 200 gallons of water ; for the codling moth, 1 pound to 250 gallons ; on peach trees, 1 pound to 500 gallons.

Dr. Lintner also wished to know if any varieties of honey-dew seemed to sicken the bees ; would also like examples of different races of bees for the State collection.

A resolution was passed condemning the practice of spraying during blossom-time.

MELTING BEESWAX.

(Paper by R. F. Holterman, Brantford, Ont.) We ignore facts in regard to injury in melting beeswax. Wax in southern climates should resist change of temperature, but it breaks more quickly in hives.

Have seen comb foundation injured by solar wax extractor. Foul brood is possibly spread by the wax. Wax kept near boiling point is injured.

Mr. Root—We keep our wax at 180° for several hours over water. A very high temperature and long heating will produce injury. We have kept it all night at 180°.

Mr. Dadant—It will be injured if kept too long over water. Particles of moisture separate those of wax. Reheating the foundation will brighten it.

Mr. Holterman—Mr. Albaugh uses a thin comb.

TAKING OUTLINES OF FRUITS.

The young nurseryman, who wishes to retain impressions of many kinds of fruits, and to employ the best way of securing accurate outlines, is informed of an easy and rapid way which we have employed successfully for many years: First, procure a thin-bladed and sharp knife, to cut the fruit accurately through the center. Divide it straight and smoothly, beginning at the calyx or blossom end, and down through the core, splitting the stem through the middle. Select the best shaped half for making the impression. With a pen or camel's hair pencil touch the edge with ink all around, including the stem and calyx. With the point of the finger rub the ink lightly over the cut face, so as to give it a smooth and delicate shade toward the outside, and thinner and fainter toward the interior. A little of the juice of the apple will become diffused through the ink and will do no harm. Having procured thick unsized paper, place the inked face down upon it, and press the whole enough to make a good impression; a light rocking motion will be required to bring every part of the cut face in contact with it, and a firm pressure must be given to the stem to secure a good picture of it. Then lift the half-fruit from the paper, and if the work has been carefully done, you will be surprised at the accuracy and perfection of the image. The operator will not succeed perfectly the first time, but he will improve rapidly under careful practice. If he has two or three colors for his ink, as red for red apples, brown for russet ones, and a rich yellow for those of an orange hue, he may learn to make excellent pictures if he has a little artistic skill.

Let the novice procure a peck of common or cheap apples and try his art upon them, and he will probably be soon surprised at his proficiency. It may be hardly necessary to state that a pencil line

drawn across the stem cavity or the calyx basin may represent an even fruit with a nearly straight line, or a furrowed fruit with a waved or crooked line.

This mode may be applied to pears, but those which are quite juicy or melting should be used before they are fully ripe, or the juice will run too freely. Or, if allowed to dry two or three hours, they will print better than when freshly cut in a melting state.

It will be observed that these impressions are perfectly accurate, both as to size and form, and the size cannot be varied, as with photographs. The perfect truth with which some peculiarities are given, even more accurately than a skillful artist can copy them, will excite the surprise of the operator.

The writer has adopted and used this mode of making impressions of fruits for more than forty years with entire success, and has secured over 500 impressions of different varieties of apples, and about 300 varieties of pears; and the time required to make a single impression is scarcely a single minute. He had the pleasure of explaining this process many years ago to the two most eminent pomologists of this country, who happened to be together at Boston, and who were copying fruits by the imperfect process of placing the cut fruit with its face on the paper, and then drawing the outline by hand with a pen and ink or with a pencil—a slow and uncertain method.

SOME NOTES OF THE MEETING OF THE AMERICAN POMOLOGICAL SOCIETY.

[Rural New Yorker Short-hand Report.]

Prof. C. E. Bessey of Nebraska read a paper on the processes of fertilization, crossing and hybridization of plants. In nature the crossing was all done by insects, he said. "The time will come when the fruit man will carefully select the parents for his new fruits, also the grower of new plants." The best process of pollination was carefully described. "The operation is not difficult; it simply requires care and must be done at the right time. Collect the desired pollen; apply it with a fine hair brush to the flowers selected for crossing. Then cover with fine netting to exclude insects, the stamens having been clipped out very carefully. The stamens are mature when the pollen drops, and the pistils are mature when the drop of moisture comes upon them." A few experiments were suggested.

Secretary Brackett had found the netting insufficient to exclude insects, and for the first two weeks he uses paper bags, one or two-pound size, and then follows with the netting.

Secretary Rusk, of the Agricultural department, gave the society the official government greeting. He said: "I did not expect to make any remarks, but came over to greet you and bid you good cheer. The department is trying to do all it can in its feeble way in this branch of its labor, and we want you to assist us. You represent the finest, most interesting, and perhaps the most neglected interest pertaining to our bureau. We need more means in this work. If you will help us to secure larger appropriations, we will try to spend the money and do our best to make it valuable."

Prof. E. S. Goff, of Wisconsin, then read a paper on "Fruit districts, geologically and climatically considered." He said many varieties were entirely local, being confined to very narrow limits of territory. "A knowledge of these varying influences and districts is of great importance to those engaged in growing fruit. You can't have success in unfavorable localities. Climate does not always depend upon latitude. Generally, the more distant from the equator the more profitable is the culture of fruits adapted to the climate." Mr. Phelps objected to the comparison of Florida localities made by the essayist, and asked if he knew where the best oranges grew. Mr. Goff had not heard the supremacy of the Indian river fruit disputed. But this brought Mr. Adams to his feet with a warm protest. Mr. Hale said there were little spots here and there, specially suited to certain fruits, and it was the growers' business to hunt them up.

"Recent advances in dealing with insects affecting fruits," was the title of an interesting paper read by Prof. Riley. "The plum curculio hibernates in the beetle state in the woods, emerges quite early in spring, before the leaves come out. It feeds upon the tender shoots and young fruit. The amount it needs is very slight. The female makes the familiar crescent mark on the young fruit. The larva feeds upon the fruit, too, and bores into it. The arsenical sprays are not so satisfactory for this insect as for the codling moth. Recent experiments confirm this. A certain portion of the beetles are destroyed, and perhaps it pays to spray, but jarring is better, or as good at least. There is no such necessity for spraying as in the case of the apple. The foliage of the plum, and especially the peach, is more badly affected than is that of the apple. When the Bordeaux mixture is used with the other the injury is less. It is safer to use them together. But the combination of an insecticide with a fungicide is not desirable as a general thing. It has proved no great gain, for though effectual as an

insecticide it is not so good as a fungicide. It is all right for the stone fruits, but not for apples, as it fails to reach the scab. Black knot has appeared less on trees so treated. It is the experience of fruitmen that it is valuable after all, even more so perhaps than our scientific experiments. Together they should be very valuable indeed.

"Forty-five new insects injurious to fruits have been discovered since last year. Among these is an apple maggot, which has proved injurious in the East. It develops in the fruit in barrels and bins, the eggs being inserted through the skin. The female lays from 300 to 400 eggs. No remedy has been found as yet. It came from abroad. A new two-winged fly, peculiar to the subtropical region, may prove injurious to the peaches in Georgia and the South; another danger is threatened by the Japanese peach fruit-worm, allied to the codling worm. It comes in June and August, the eggs being deposited on the apex of the fruit. It destroys 90 per cent of the peaches in Japan. The truth is, fruit-growing has come to be a business requiring considerable knowledge, scientific knowledge in fact." Mr. Engle asked about the apple curculio, which caused gnarly fruit. Prof. Riley said it belonged to the same family, but differed from the plum species; it was a long-snouted beetle with four humps on its back. It bores a round hole in the apple. "There is a vast number of these curculios," he said. Mr. Williams spoke of much damage from the pear midge in New Jersey. Prof. Riley said it had been unusually prevalent this year. "It is probably an imported insect, which we have not yet learned to manage." He warned growers in California and other seaboard states against the introduction of foreign insects, even as destroyers of insect pests here. A great mistake might easily be made, and such work should be intrusted only to scientific gentlemen, who should act in the most careful manner.

BLACK TEA AND GREEN.

What is the difference between black tea and green tea? Are they produced by different plants, or merely by different methods of treating the leaves? And are the Oolong and Japanese teas, so popular in this country, really green teas or black? One so often hears these questions asked, and so seldom gets a reliable answer, that our readers may be interested in the following account of Japanese tea-production, which we quote from Mrs. Seidmore's "Jinrikisha Days in Japan:"

The Tea-plant, as every one knows, is a hardy evergreen of the Camellia family. It grows a thick and solidly massed bush, and, at first

glance at a field regularly dotted and bordered with the round bushes setting close to the ground, one might easily mistake it for Box. In the spring the young leaves crop out at the ends of the shoots and branches, and when the whole top of the bush is covered with pale golden-green tips, generally in May, the first picking takes place. The second picking belongs to the fire-fly season in June, and after that great festival tea comes in from the plantations in decreasing quantities, until the end of August. The choicer qualities of tea are never exported, but consumed at home. Choice basket-fired tea, such as is used in the homes of the rich and well-to-do Japanese, sells for one or two dollars a pound. There are choicer, more carefully grown and prepared teas, which cost as high as from seven to ten dollars a pound, but such teas are shaded from the hot suns by matted awnings, and the picker, going down lines of these carefully tended bushes, nips off only the youngest leaves or buds at the tip of each shoot. The average tea, bought by the exporters for shipment to the United States and Canada, is of the commonest quality, and according to Japanese trade statistics, the average value is eleven cents a pound, as it stands, subject to the export duty and ready for shipment abroad.

Japan tea came into market as a cheaper substitute for the green teas of China, those carefully rolled Young Hysons and Gunpowders of our grandmothers' fancy. Europe has never received the Japan teas with favor, but the bulk of American importations is Japanese. For green tea, the leaves are dried over hot fires almost immediately after picking, leaving the *theine* or active principle of the leaf in full strength. For black tea, the leaves are allowed to wilt and ferment in heaps for from five to fourteen days, or until the leaf turns red and the harmful properties of the *theine* have been partly destroyed. The Oolong tea of South China is nearest to green tea, its fermentation being limited to three or five days only, when the richly flavored black teas of North China are allowed to ferment for twice that period, to prepare them for the Russian and English markets. The Japanese government made experiments in the manufacture of black tea in the province of Ise, but the results were not satisfactory, and no further efforts have been made to compete in that line with China. Japan will continue to furnish the world's supply of green tea. The young tea-leaves, picked in May and early June, comprise more than half the whole season's crop, succeeding growths of leaves being coarser and having less flavor. Tea which is to be exported is treated to an extra firing, to dry it thoroughly before the voyage, and, at the same time, it is "polished," or coated with indigo, Prussian blue, gypsum and other things, which give it the gray luster that no dried tea-leaf ever naturally wore, but

that America tea-drinkers insist on having. Before the tea-leaves are put in the pans for the second firing, men, whose arms are dyed with indigo to the elbows, go down the lines and dust a little of the powder into each pan. Then the tossing and stirring of the leaves follows, and the dye is worked thoroughly into them. This skilled labor is paid for at rates to make the Knights of Labor groan, the wage-list showing how impossible tea-culture is for the United States until protectionist tea-drinkers are ready to pay ten dollars a pound for the commonest grades. During the four busy months of the tea-season the firers are paid the equivalent of eleven and four tenths cents, United States gold, for a day's work of thirteen hours. Less expert hands, who give the second firing, or polishing, receive nine and six-tenths cents a day. Those who sort and finally pack the tea, and who work as rapidly and automatically as machines, get the immense sum of fifteen cents. Each year the United States pays over \$7,000,000 for the nerve-racking green tea of Japan.

FERTILIZATION.—On the subject of fertilization, Prof. Ganong said that most plants cannot exist many years in perfect health without an occasional cross. Within the limits of a given species crosses between the more widely differing varieties give healthier and better results. In some cases crosses are obtained between species, and on rare occasions between distinct genera. Species is the result in nature of the intense struggle to survive made necessary by the long competition with other forms.

Referring to the frequent difficulty in determining species, he stated that the only real test botanists have to determine species is the ability of the plants to cross. If they will not cross they, as a rule, belong to different species. Theoretically, the offspring of two varieties in the same species will be fertile, but the offspring from two different species will be barren. In the offspring the tendency is to reproduce equally the character of both parents, but the process is interfered with to a great extent. The wide range of variations in offspring gives the gardener and nature something to work on. Crossing should be done between forms as greatly separated as possible, but not so widely separated as to prevent fertility.

In reply to a question by Mr. Dawson as to whether the pollen plant or the seed parent had the greatest power over the cross, Prof. Ganong replied that the whole question of the transmission of character is still in a very unsettled state.—*American Florist*.

RENOVATING WORN-OUT LAND.

By Prof. W. F. MASSEY, North Carolina Experiment Station.

The subject of growing pecan nuts seems to become a sort of craze in the South. That pecans will grow readily, and, after a while, make crops of nuts, there is no doubt, but that thousands of farmers can raise them for commercial purposes, and make money out of them, appears extremely doubtful. What the South needs far more than new specialties is to grow the old crops better. We have a rich variety of crops and a climate which admits of a more rapid improvement of soils than that of the North, because of the variety of leguminous crops we can grow in summer and winter. But our farmers go on, year after year, putting their land in cotton, and gambling on the chances of getting the fertilizer bill out of it. And when the chances are against the gambler, and the cotton does not pay, his last card for the season is played, and he at once tries to hunt up something else he might make a specialty of in place of cotton.

It is not cotton culture that has hurt the cotton planter, or tobacco culture that has injured the tobacco planter. The whole trouble is that they are merely planters and not farmers. Until our Southern farmers cease to look upon the land as merely a place to plant in and sow fertilizers upon, they will always have these constantly recurring seasons of trouble when the cotton fails to pay. No section can prosper permanently, in the long run, from the exclusive culture of a special crop. No matter what the crop is, the continual culture of one crop in great areas leads to poverty and "old fields."

The Southern farmer is not the only man guilty of this, though he drifted more naturally into it under the influence of the "patriarchal institution," for the bonanza wheat-farmers of the Northwest are on the same road. The fertile soil may stand it longer, but the constant culture of wheat will exhaust land as fast as, or faster than, that of cotton, and worn-out land in Dakota is worse than worn-out land in the South because of climatic restrictions.

The wonderful rapidity and low cost at which our worn-out land can be brought to great productiveness is a constant surprise. No better illustration can be found than the lands attached to the North Carolina Agricultural Experiment station. Only a few years ago this was a bare hill-top in an old field, and, notoriously, the most poverty-stricken spot of land in the county. It might perhaps have made, in

a good season, five bushels of corn per acre, but probably less. And yet we have on this poverty-stricken hill, to-day, a variety and luxuriance of growth which is surprising to those who have known the land. And it has not been by lavish expenditure of the station funds that it has been brought up, but merely by the aid of those potent factors in soil improvement in the South, cow-peas and crimson clover, and at no greater cost than any farmer can afford. We have one piece of land, several acres in extent, which has grown a crop of ensilage corn every year for four years. The first crop was a miserably poor one, and each succeeding one better, while this year's crop would have made forty to fifty bushels of corn per acre had it been cured for grain. The agent in this was crimson clover, aided by deep plowing of the red, clayey soil. Each season, as the corn is cut off, seed of crimson clover is sown on the land. By April, it is knee high and is turned under later, when fully mature, and corn is planted. In the short space of four years this barren hill-top has come to rival the rich bottom lands at a cost of \$1.50 per acre for clover seed. And yet all around us are fields of cotton which stand all winter, with rows of brown stalks and the bare ground washing all winter, and the owners longing for some crop that pays better than cotton.

This corn experience is not offered as a specimen of good farming, but merely to illustrate the ease with which these worn, red, clayey hills can be restored. With the Southern cow-pea in summer and crimson clover in winter, and a fair rotation of corn, wheat and cotton with them, and stock enough to consume the abundant food supply and make manure, the Southern farmer should become independent of expensive manures and the cotton factor, and not need to rush into doubtful specialties.

Mr. Powell, in "Country Gentleman," gave an address on the needs of small fruits for the farm. He thought more attention should be given to secure a succession in abundance. First in the list is the strawberry. The strawberry contains the very thing the system needs to tone up the digestion after the winter's high living on substantial solids. The farm has few if any of the things the city denizen calls an absolute luxury. The farmer's garden is mostly all resolution; when the harvest comes, then the resolutions are "passed." Shut up the hens and have an open garden; plant long, straight rows of the small fruits, and use horse labor to cultivate the rows; then you can fight the weeds rapidly and thoroughly. Choose May King, Crescent,

Capt. Jack and like varieties, so as to have a long season. Have lots of currants; have white and red sorts; red and black-cap raspberries, and then the blackberries. The lack of this fruit arises often from a lack of definite knowledge in regard to the laws of small-fruit life. A little information, coupled with experience, will put a farmer in love not only with the cultivation of small fruits, but the fruit itself. Berry bushes should be kept pruned, not allowed to sprawl, and will bear more fruit. A raspberry plant, if kept pruned, is good for ten years' bearing.

THE WORLD'S FAIR.

The Department of Horticulture desires to have the planting of the various hardy plants completed by May 1, 1892. This applies especially to such trees, shrubs and plants as are included in the appended lists. Intending exhibitors will do well to carefully peruse and note what must necessarily be done.

The department wishes to impress upon all those who desire either to make competitive groups or donate or loan trees, shrubs or plants, that under no circumstances will poorly grown or badly rooted plants be accepted. All material must be better than ordinary nursery stock; in other words, it must be shapely, vigorous and large enough to be effective. For instance, shrubs like *Deutzia crenata* fl. pl., should be three to four feet high with six to eight canes. *Spiraea callosa* not less than twenty inches in diameter. Evergreens must also be characteristic.

The plans for this section of the Horticultural department are now being prepared, and will be completed by the 1st of March.

The department will plant and care for all trees, shrubs and plants during the entire season of 1892, providing contributors will give the department full control of the same, as it may be necessary to remove some of the roses, pæonies, etc. immediately after flowering in 1893. In this case, many of the plants would not be of any value to transplant in the summer time.

A complete list of all trees, shrubs and plants as are intended to be supplied must be forwarded not later than March 1, 1892.

Plants must be correctly labeled and duplicate invoices sent with each consignment.

LIST OF PLANTS.

Azalea mollis, *A. pontica*, *Berberis canadensis*, *B. Fortunei*, *B. Thunbergii*, *B. vulgaris*, *B. v. fructa violacea*, *B. v. purpurea*, *Colutea arborescens*, *Cornus mascula variegata*, *C. elegans variegata*, *C. Siberica variegata*, *C. Spæthia*, *C. variegata*, *Cercidiphyllum japonicum*, *Cydonia japonica* varieties, *Deutzias* of all kinds, *Diervilla* (*Weigela*), *Forsythia*, *Hibiscus* (*Althea*), *Hydrangea*, *Hypericum*, *Kerria*, *Ligustrum*, *Lonicera* (shrubby species), *Philadelphus*, *Prunus*, *Rhodotypus*, *Rhus glabra*, *Sambucus nigra aurea*, *Spirea*, *Syringa* and *Lilac* (these must be strong enough to flower or they will not be acceptable), *Xanthoceras sorbifolia*.

Acer (Japanese of good size, all kinds), *A. dasycarpum heterophyllum laciniatum*, *A. Wierii*, *Ampgdalus*, *Cerasus* (double flowering), *Cercis*, *Magnolias* (providing they have been recently transplanted and have good roots), *Prunus*, *Pyrus malus* (ornamental varieties).

CLIMBERS.

Actinidia polygama, *Akebia quinata*, *Amyelopsis Veitchii* (large), *A. Roylei*, *Clematis* of all kinds, *Dolichos japonica*, *Hedera helix* (large plants well rooted), *Menispermum*, *Periploca græca*, *Wistaria* (must be very strong and well rooted).

EVERGREENS.

Fine specimens with good roots and that have been frequently transplanted: *Abies Alcockiana*, *A. A. nana*, *A. canadensis*, varieties; *A. Douglasi*, *A. excelsa*, varieties; *A. Maximowiczii*, *A. Menziesii*, *A. Morinda*, *A. nigra*, *A. n. pumila*, *A. obovata*, *A. orientalis*, *A. polita*, *A. pungens*, *Biota orientalis* and varieties; *Chamæcyparis* in variety; *Cupressus Lawsoniana* and varieties; *Juniperus* species and varieties, especially prostrate forms; *Picea* species and varieties; *Pinus* species and varieties, especially dwarf forms; *Retinospora* of all species and varieties; *Sciadopitys verticillata*, *Taxus* species and varieties; *Thuopsis borealis*.

ROSES FOR THE OPEN GROUND.

A most unique and beautifully designed rose garden is now being planned which will accommodate about 50,000 plants; besides, large areas of space have been reserved where large groups of roses will be planted.

The rose garden will be of classic design, with temples, arbors, archways and trellises. The great masses, the people, have not had an opportunity to see a typical rose garden. The time has now come and nothing should be left undone to insure a magnificent display.

Rose-growers will please read carefully the remarks with regard to trees, shrubs and plants being ready for planting before May, 1892.

It is expected that large and substantial premiums will be offered for roses as well as for all other plants besides the awards that will be made by the United States Commission.

Plants of roses may be either on their roots, budded or grafted. Plants on their own roots may be from not less than 3½-inch pots, of the current year's propagation, or they may be one or two-year-old dormant plants. Well-rooted budded plants, with the buds dormant, will be admitted, thus giving an opportunity for obtaining greater variety.

The above remarks apply to H. P. and other hardy roses. Teas, noisettes and other tender kinds will require different treatment, and it is suggested that strong plants in 5-inch pots be carried over in cold frames, to be planted early in 1893.

A GOOD WHITEWASH.—Put one bushel of quicklime in a barrel, slake the lime by pouring over it boiling water until you have it about four inches over the lime. Dissolve one pound of sulphate of fine white vitriol in water, then stir in the whitewash while warm.

To make a brown color, add two pounds of yellow ochre; for a fawn, two pounds burnt umber and half pound lamp-black; stone color, half pound umber and one pound of lamp-black.

Last week Professor J. L. Edwards delivered a lecture at Chautauqua on the Arboretum at that place. Among other interesting statements he said that there are found there 56 different species of native trees, or half the number of species in the State. The tallest is a Hickory, 132 feet high. The largest is a Red Oak, 23 feet in girth and 110 feet high. Twenty trees average 17 feet in girth. The largest stump is that of a Chestnut, over which was built the original Chautauqua platform; it measures 27 feet around. The speaker said that all people, and especially young people, should become interested in trees, for the following reasons: Such a study cultivates habits of observation; the knowledge gained is intrinsically valuable; trees have interesting historic and patriotic associations; communion with nature is wholesome, cheering and ennobling; literature is permeated with the spirit and imagery of the forest. The very terms employed in literary work are redolent of the woods. Paper from Papyrus, book from Beech, library from liber, the inside bark, and leaf from leaves of the trees.

THE OUTLOOK FOR THE FUTURE.

This retrospect of the half century covers a period which represents a very large part of the agricultural achievement of North America since the advent of white men. What will be the record of the next half century? Where is the seer who can accurately forecast it?

There are signs of the times that at least foreshadow probable development. So far, our agriculture has not passed its crude stage. Its mission has been to subdue land, under a practice that has been wasteful. Intensive culture has only occasional examples, too scattering to serve efficiently as object-lessons. Our agricultural schools and experiment stations are reaching practical farmers through results of their experiments and their stimulation of popular teaching in farmers' institutes, dairy conferences and grange discussions. The rural classes are enjoying educational influences which cannot fail to render agriculture more productive and remunerative. Superficial culture and low yields should no longer characterize it. We must not forget that with the average yield of England our wheat area is more than ample to produce a thousand million bushels. It is folly for us to rest stolidly with twelve bushels per acre. So with many other crops. A few individuals, intelligent, alert and thorough, are already doubling these old averages. A few may follow their example in a year. In fifty, what may we expect?

Progress in these lines, directed by skill and industry, business tact and close economy, will bring to the farmer comfort and competence, which the indolent and improvident can never share. The one will ever be cheerful and thrifty; the other in debt, difficulty and despondency. The one will be indebted to mind and muscle for his fortune; the misfortune of the other will be indebtedness represented by a mortgage.

Professor Goodale, in his address as the retiring President of the American Association for the Advancement of Science, in speaking of the possibilities of economic botany, said that the methods of improving plants are already known so well that "if all our present cereals were swept out of existence, our experiment stations could probably replace them by other grasses within half a century. New vegetables may be reasonably expected from Japan, which has already sent us many choice

plants in all departments, and it is likely that some of our present vegetables, which are now much neglected, will come into greater favor and be improved. The fruits of the future will tend more and more toward becoming seedless, just as pine-apples, bananas and some oranges are now. There is no good reason why we should not have seedless raspberries, strawberries and blackberries, and also raise, by cuttings, plums, cherries and peaches free from stones."

INTENSIVE FARMING.

Year by year we are coming nearer the farming that has long prevailed in Europe. In the Eastern states the aim is to grow a large crop upon a small area, while in the far West the total only is looked at, and acres are completely worthless. But things are changing. Land is going up as the fertility is going down, and soon it will be necessary to base everything upon the market value of a load of dung. There is much comfort in this for the Eastern farmer, who needs to use every scrap of fertilizer he can rake and scrape together. He cannot afford to dissipate the effect of a ton of fertilizer upon a ten-acre field. He feels that he cannot sow it broadcast upon a single acre, but carefully places a handful in each hill of corn or potatoes. Manure is as much a factor in farming as seed, and the load from the barnyard goes ahead of the seed bag from the granary. Till well what is tilled.

ORCHARDING IN MERCER COUNTY.

PRINCETON, Mo., December 2, 1891.

L. A. GOODMAN, Esq., Sedalia, Mo.:

DEAR SIR—I enclose a blank agreement which will give you some idea of how we cultivate young orchards in Mercer county. I would plant in a commercial orchard of 1,000 trees 400 Ben Davis, 200 Willow Twig, 100 Jonathan, 100 Grimes, 100 Maiden Blush, 25 Wealthy, 25 Chenango Strawberry, 25 Snow, 25 Duchess; if more than the thousand is planted, I would add 25 each of about half dozen other varieties, then increase the proportion of those varieties named above to make any amount desired. I like low heads, just high enough so the bodies of the young trees can be protected from the rabbits; I never prune after the

cutting back at setting out, thus leaving the tree like a well-painted house perfectly enclosed by the bark ; no place for decay to commence, the small limbs and twigs answer for springs for the fruit to ride on during a storm. Thinning the fruit and hauling manure in the orchard, will beat the pruning for big apple.

We are encouraged here in orcharding. Over one million pounds of apples were shipped from one of our eight railroad stations in this county last year, and were sent to all the eastern and foreign markets, and pronounced excellent by all. Legislation is needed in regard to freight rates, etc. The shipper under the present rule must guarantee the freight (a high one too), and his bill of lading further states loss by decay and pilfering must be sustained by him. Shipper might as well bill calico, boots and shoes, so the railroad would not be liable for theft in the handling of any other merchandise. New York can send her fruit to Davenport, Minneapolis, Council Bluffs, Des Moines, etc., for as little as we can, but when we want to send a car further west or north they are very sure to add it on to us. A distance tariff should be given to all.

Peaches are safe yet. Our apple trees are in good shape for a full crop next year. When you go to the World's fair, look for Mercer county's fruit show ; it will certainly be there. We expect to reorganize our horticultural society this winter. We expect Secretary Goodman to meet with us some time next year.

Respectfully,

H. R. WAYMAN.

Article of agreement, between ———, of the first part, and ———, of the second part.

Witnesseth: That ———, party of the first part, agrees to let to said party of the second part the following described tract of land :

For the term of five (5) years, free of any rent. Which is, or shall be planted in fruit trees, provided that the said ——— shall cultivate said tract according to the manner hereinafter described, to wit: The first, second and third years the ground shall be broken up in early spring with a two-horse plow (using Sherwood harness), and planted to corn, potatoes or any root crop, and well cultivated till August 1st of each year. No grass or weeds shall be allowed to grow within six feet of the trees till the 15th of August. During the last half of June, each year, the bodies of the trees shall be washed with weak lye. During the month of September the soil must be removed from the body of the trees down to the roots and left thus four or five days ; then, after carefully searching out the borers, the soil shall be drawn about the tree, leaving it something like a sweet potato hill. During the month of October, the bodies of the trees must be securely wrapped, either with straw, prairie grass or tough paper, to protect them from rabbits. Stock of no kind shall be allowed to run or pasture on said tract of land. No pruning shall

be done except to keep off sprouts from the roots or body of the tree. The fourth and fifth years the ground shall be sown to rye not later than September 15th, and the following spring, when the rye is in bloom, it shall be turned under, and the land well cultivated till August 1st. (The seed rye to be furnished by the first party, free of cost to the second party.) Crops must not be planted nearer than four (4) feet to any tree. If corn-fodder is removed from the land, one ton of good manure must be added to each acre from which the fodder has been taken. A reasonable effort must be made to keep washes or ditches from forming.

Failure to perform, according to the specifications herein stated, the second party shall forfeit cash or grain to the amount of three dollars per acre for each year he may thus fail.

It is expressly agreed herein that any misunderstanding of this contract, or any other trouble that may arise from causes unforeseen or matters not mentioned in this contract, shall be settled by three disinterested men chosen by the parties interested in this contract.

Witness our hands this ____ day of ____, 189—.

CULTIVATING ORCHARDS.—Some years ago the late Patrick Barry said, in allusion to the well-known tendency of cultivating pear orchards producing blight: "In my pear garden, to lessen the chances of blight, I slacked off both in cultivation and manure. The result was, in two years one-half of my crop were culls. My trees, instead of making stout shoots twelve to eighteen inches long, made scarcely any growth at all." Many years' experience has given us similar results, although perhaps somewhat less striking, and we have long since found it more economical to cultivate and manure, and thus obtain fine specimens, even if we lose more trees by blight. One good crop will often pay for the loss of a tree.—*Country Gentleman*.

THE RAILROADS OF MISSOURI.

By L. A. GOODMAN, Secretary.

I herewith present maps of the most important railroads of Missouri, and a list of the counties through which they pass.

Missouri has so much good fruit land that a person may settle on any of the lines of railroad and find lands well adapted to fruit-growing—some more especially adapted to apple-orcharding, others for vineyards, others for small fruits, others for pear-growing, and still others for peach orchards, and still many other locations where all of these fruits will do their very best.

I believe that, as Missouri has more good fruit lands to-day than any other State of the Union, so the time is coming when there will be seen all over our State the grandest, largest and best orchards in all the world.

The best of markets are at our doors, east, west, north and south. The best railroads of the country are within our borders, and they can take this surplus to any part of our country without change of cars.

It will not be many years before our State will stand with the first of our land in fruits, as well as all other matters. We have the best lands, hills, valleys, timber and prairies in the country. We have the best hogs, cattle, sheep, horses and mules to be found anywhere. Within our borders are the best mines of coal, iron, lead, zinc; the best timber; the best rivers, creeks, brooks and springs; the best geographical location and the best climate; the best schools and the best churches; the best railroads and the — country roads; so that any seeker for a new home can find the climate, soil, location, markets, railroad communication, and *every* requisite to make a pleasant, happy and prosperous home.

Lands can be still had in Missouri from the government home-stead, for the settling on it, or at the price of \$1.25 per acre, or the railroad lands at \$3.00 to \$5.00 per acre, or the wild lands at \$4.00 to \$8.00 per acre, up to lands at all prices, from \$10.00, \$20.00, \$40.00 or \$100.00 per acre, for the finest improved farms in the country, or finely improved and bearing orchards from \$100.00 to \$500.00 per acre.

There are plenty of cheap lands for the poor man, and the best of opportunities to make a good home and a good living.

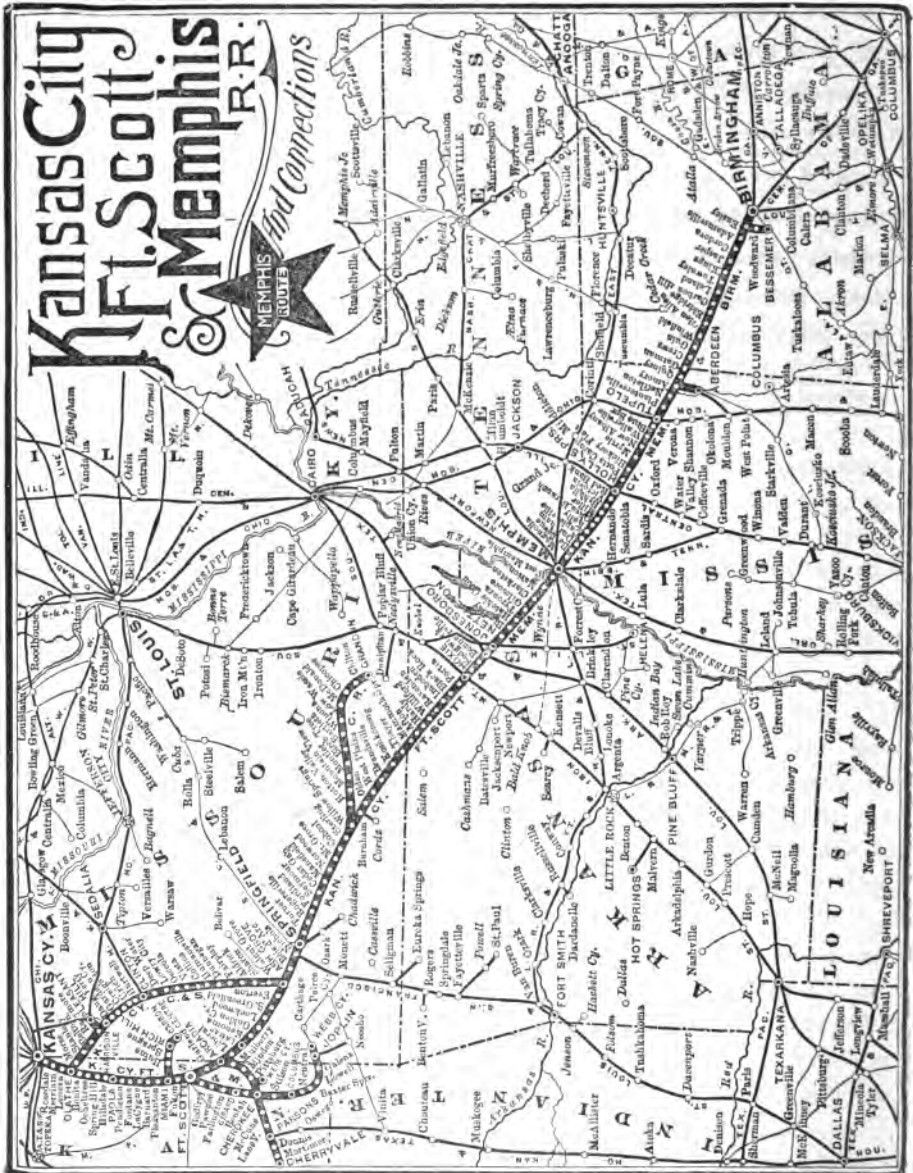
RAILROAD MILEAGE.

Name of road.	Mileage in State.
Missouri Pacific.....	1,296.02
Atchison, Topeka & Santa Fe.....	919.08
Burlington system.....	886.25
Kansas City, Fort Scott & Memphis.....	517.47
Wabash system.....	569.13
Chicago & Alton.....	262.72
Chicago, Rock Island & Pacific.....	231.91
Missouri, Kansas & Texas.....	248.00
Chicago, Milwaukee & St. Paul.....	140.27
Forty other railroads.....	967.83
Total mileage.....	6,038.68

THE KANSAS CITY, FORT SCOTT & MEMPHIS RAILROAD,

Running through the rich and growing counties of Jackson, Cass, Henry, St. Clair, Cedar, Polk, Greene, Barton, Dade, Webster, Wright, Texas, Howell and Oregon.

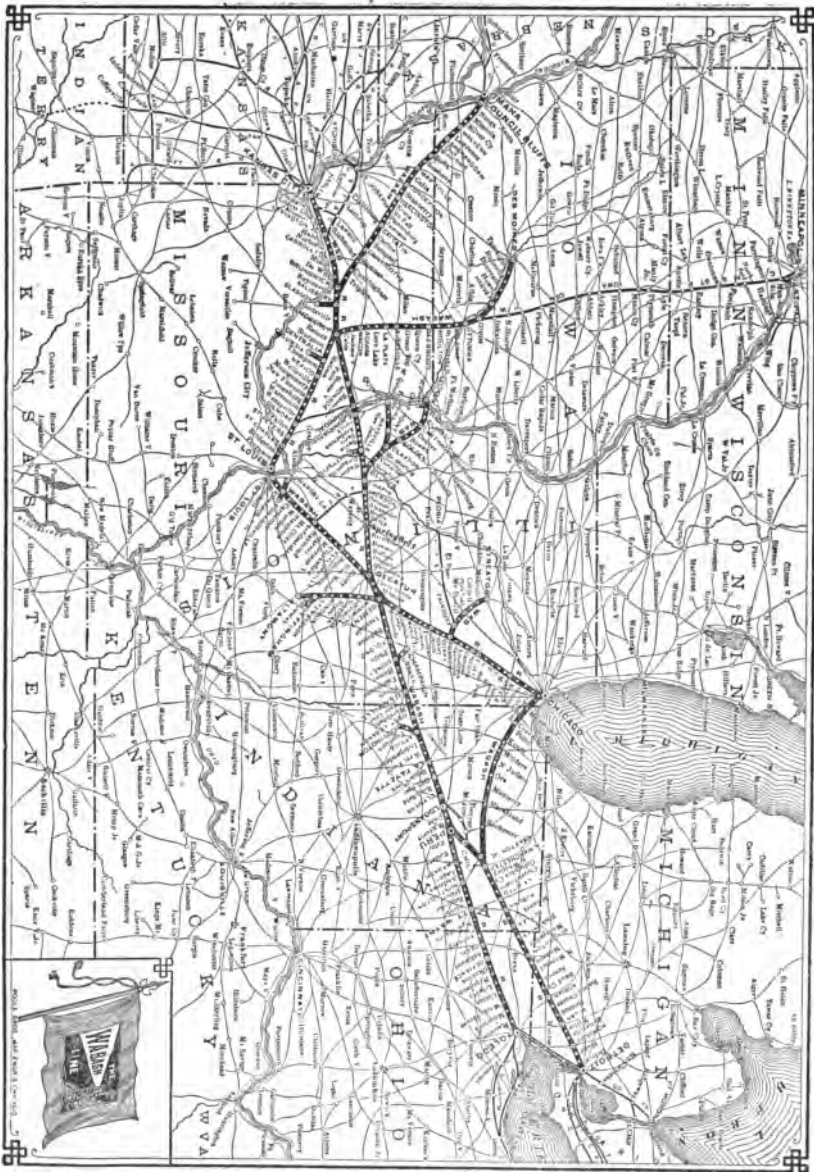
Fourteen counties and 517.47 miles.



THE WABASH SYSTEM,

Running through the richest of the Missouri river bottom lands north of the river, and some of the northern counties.

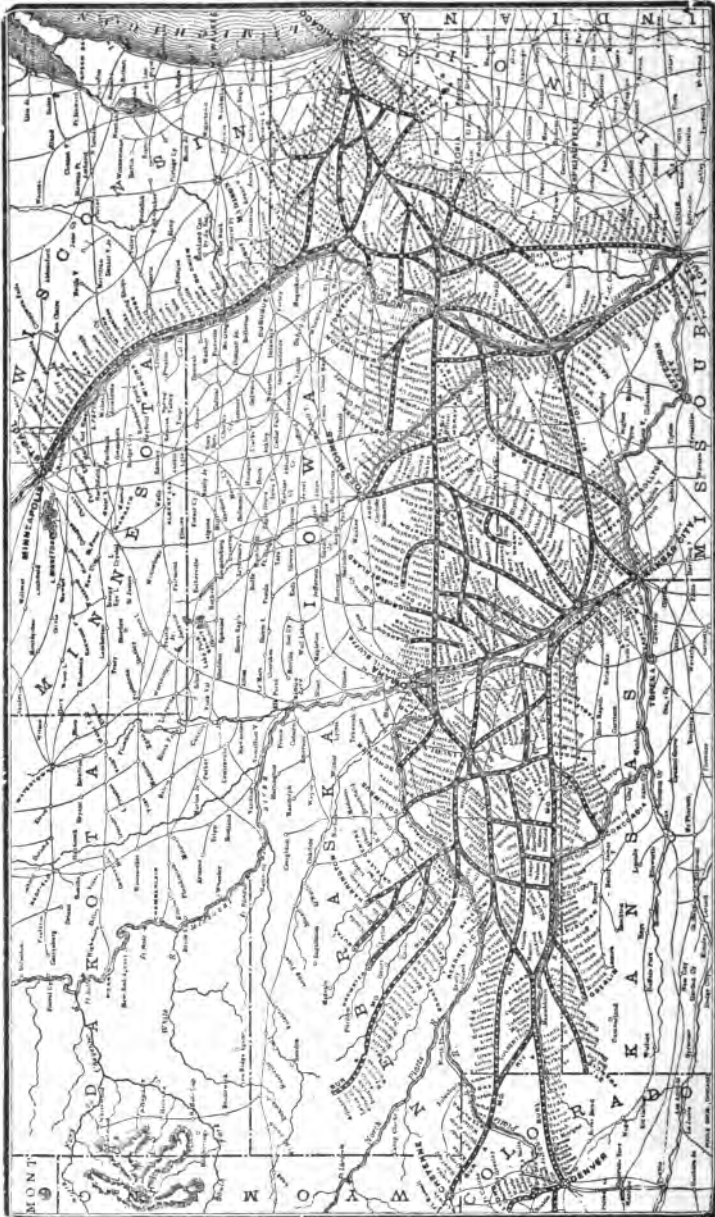
St. Louis, St. Charles, Warren, Montgomery, Audrain, Boone, Randolph, Macon, Adair, Schuyler, Chariton, Howard, Linn, Livingston, Daviess, Gentry, Nodaway, Atchison, Carroll, Ray, Clay, Jackson—22 counties and 569.13 miles.



THE BURLINGTON SYSTEM,

Running through some of the most valuable and best improved counties north of the river.

St. Louis, St. Charles, Lincoln, Pike, Ralls, Marion, Lewis, Clark, Scotland, Schuyler, Shelby, Macon, Linn, Sullivan, Putnam, Chariton, Carroll, Livingston, Caldwell, Clinton, Clay, Jackson, Platte, Buchanan, Andrew, Holt, Atchison, Nodaway, DeKalb, Gentry, Harrison—31 counties and 886.25 miles.



MAP OF THE CHICAGO & ALTON RAILROAD,

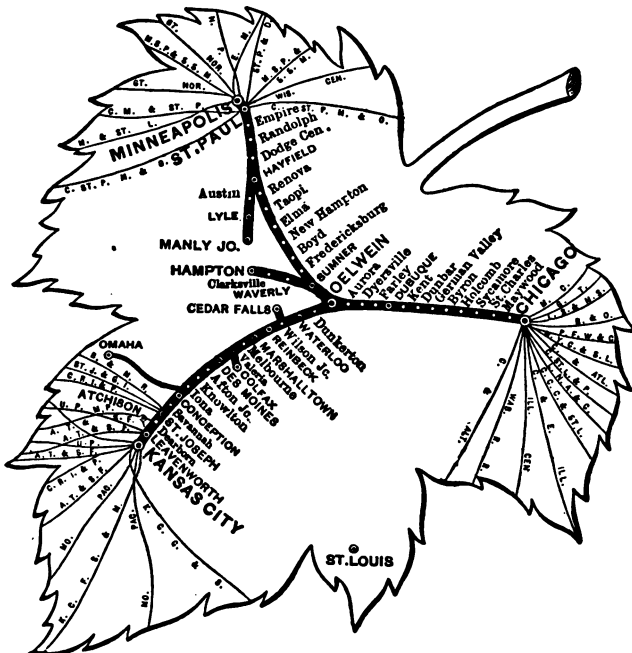
Running through some of the very richest agricultural counties of Central Missouri, equal to, or superior to, the best lands of the world.

Jackson, Lafayette, Saline, Howard, Randolph, Boone, Audrain, Callaway, Pike—9 counties and 262.72 miles.



THE CHICAGO, ST. PAUL AND KANSAS CITY

Runs through the counties of Buchanan, Andrew, Nodaway and Worth.



THE ATCHISON, TOPEKA AND SANTA FE,

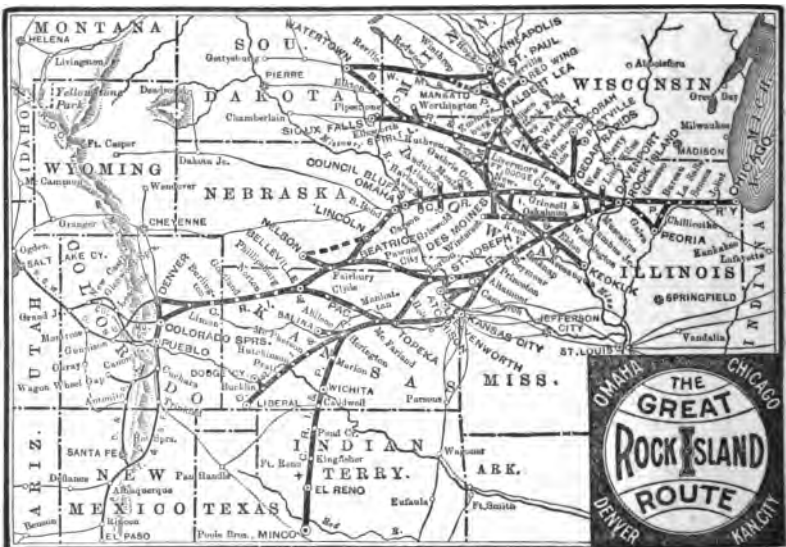
Running through the State east and west, both north and south of the river, embracing the "Frisco line."

Jackson, Ray, Clinton, Buchanan, Carroll, Chariton, Mercer, Adair, Knox, Scotland, Clark, St. Louis, Franklin, Crawford, Dent, Phelps, Pulaski, Laclede, Webster, Greene, Christian, Lawrence, Barry, Newton, Jasper—25 counties and 919.08 miles.

**THE CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD,**

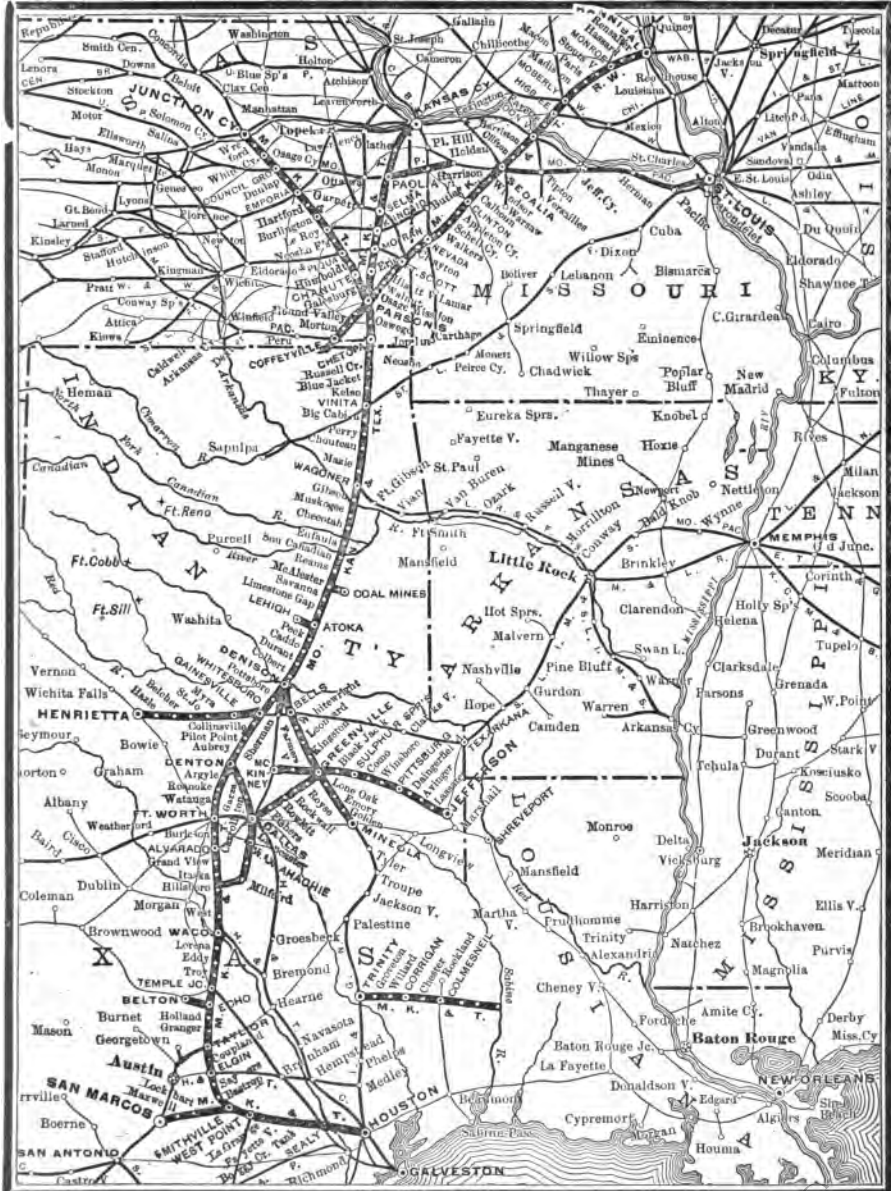
Running across some of the beautiful prairies and rich bottoms of the northern part of the State.

Jackson, Clay, Platte, Buchanan, Clinton, DeKalb, Daviess, Grundy and Mercer—9 counties and 231.91 miles.



THE MISSOURI, KANSAS AND TEXAS RAILROAD.

This road, entering the State at the northeast and passing out at the southwest, is one of the important railroads of the State, and passes through some of the richest agricultural lands, some of the finest stock-growing country and some of the best fruit lands one would wish to see. Reaching the markets easily at Chicago and Kansas City, and Texas for the South, it gives the land-owner many advantages. The road runs through the counties of Marion, Ralls, Monroe, Randolph, Howard, Cooper, Pettis, Henry, St. Clair, Bates and Vernon—11 counties, 248 miles.



CHICAGO, MILWAUKEE & ST. PAUL RAILROAD,

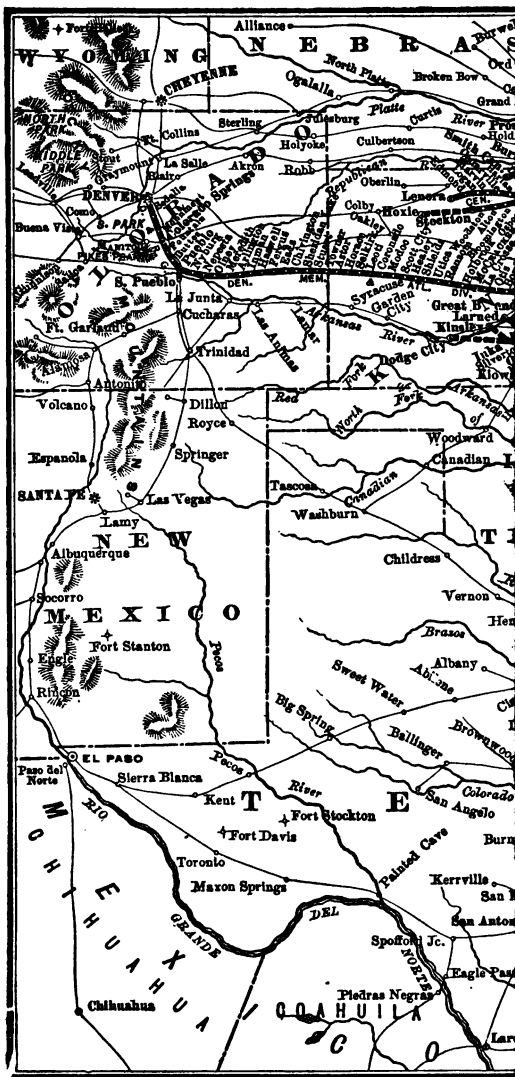
Running from Kansas City north into Iowa, and through some very valuable lands :

Jackson, Clay, Ray, Caldwell, Carroll, Livingston, Grundy, Sullivan, Mercer, Putnam—10 counties and 140.27 miles.

THE MISSOURI PACIFIC RAILROAD,

Running through the richest counties of the State, and reaching almost every part of the State south of the Missouri river.

St. Louis, Franklin, Gasconade, Osage, Cole, Moniteau, Miller, Morgan, Cooper, Pettis, Benton, Saline, Lafayette, Johnson, Jackson, Cass, Bates, Vernon, Barton, Jasper, Jefferson, Washington, St. Francois, Iron, Wayne, Butler, Ripley, Madison, Bollinger, Cape Girardeau, Scott, Mississippi, New Madrid, Stoddard—34 counties and 1,296.02 miles.



MAP OF THE

INFLUENCE OF PLANTS ON THE AIR OF LIVING-ROOMS.

ED. AM. FLORIST.—One of our high-school pupils wishes to know whether plants in a bed-room vitiate the atmosphere. I am not able to reply to this question quite as positively as I would like. Will you please give in the Florist the conclusions recently arrived at upon this point, with any explanations of the relations of living plants to the air of rooms, both night and day, which may make the subject more clear to the school.

W. F. BASSETT.

Every green plant, whether flowering plant or fern, takes carbonic acid from the air and water from the soil, and these substances are separated into their chemical elements (carbon, oxygen and hydrogen), and the elements recombine to form starch or some other carbo-hydrate in the green parts of the plant. This formation of organic matter out of inorganic is sometimes spoken of as the fixation of carbon, since this element, which previously existed in the form of an invisible gas, is thereby fixed in the solid or liquid structure of the plant; it is also sometimes spoken of as assimilation. Taking starch as representing the first evident product of assimilation, which is generally the case—although it may not be the first product actually formed—it is observed that decomposition of an amount of carbonic acid and water sufficient to furnish carbon and hydrogen for a given amount of starch liberates a certain quantity of oxygen not used in forming the latter, and the oxygen thus set free is equal in quantity to that previously combined with the carbon in the carbonic acid removed from the air. It may be said, then, that green plants remove from the air carbonic acid—which, beyond a certain percentage, renders air unfit for the respiration of animals—fix its carbon in their own substance, and return the entire amount of oxygen contained in this carbonic acid to the air as free oxygen, thus increasing its value for respiration. But this fixation of carbon and the consequent liberation of oxygen occur only in the green parts of plants, and under the effect of strong light like daylight or the electric light; so that the plants of a living-room exercise this purifying influence on the air only during the day-time, and so far as this is concerned, are inert at night.

On the other hand, the organic matter which results from this process undergoes within the plant many changes, some of which fit it for transportation from one part of the plant to another, while others attend

its conversion from mere food material into the substance of the plant itself. Some few of these changes result in the liberation of a further amount of free oxygen, and to this extent may be said to purify the air. But the greater number of them are accompanied by a sort of combustion, some of the carbon previously fixed becoming combined during the change with oxygen taken from the air, and thus again forming carbonic acid that is returned to the atmosphere, which is consequently vitiated to a corresponding extent. While assimilation is confined to the green parts and to daylight (or its equivalent), these processes of food elaboration, attended by the absorption of oxygen and the formation of carbonic acid, occur in all parts and at all times, but more especially in the parts of the plants which are not colored green, and during the hours of darkness, when growth is most rapid. This giving off of carbonic acid during the nutrition and growth of green plants is, in point of fact, comparable with the similar release of carbonic acid in the nutrition and growth of mushrooms, yeasts, and other plants which are not green, and of animals, so that it really corresponds to the respiration or breathing of animals by which they vitiate the air. But although the respiration of green plants occurs at all times, the carbonic acid given off as a result in the day-time is far less than that taken up by them for the fixation of its carbon during the same time.

So far as the effect of a collection of plants on the air of a room is concerned, the following statement may, therefore, be made: During daylight they purify the air by removing from it carbonic acid and giving off free oxygen far in excess of the opposite result of their respiration, while at night their influence is exactly that of animals, since their respiration then goes on with even increased force, while the fixation of carbon has ceased. Taking the average of night and day together, however, their effect is to purify the air, because they remove more carbonic acid in the day-time, if in good condition and properly lighted, than they give off at night. It must be evident also that plants with variegated leaves, or those largely in flower and fruit, will have a smaller balance to their credit than those with abundant green foliage and few flowers, because the variegated plants have a proportionately smaller assimilating power, while respiration is much greater from developing flowers and fruit than from ordinary foliage. So far as even these plants are concerned, however, their average effect is nearly always to purify the air by removing its carbonic acid and adding to its oxygen. With sickly or poorly lighted plants, the balance may be more nearly destroyed, owing to their diminished assimilation; and it is never desirable to have in a sleeping room any large number of plants

with a profusion of highly scented flowers, because of their greatly increased respiration and the disagreeable effects their perfume causes on some persons.

Fifty flower pots, or those containing a disproportionately large amount of soil,—especially if richly manured and undergoing decomposition—constantly give off carbonic acid, and may also, possibly, breed disease germs under some circumstances, so that their condition should be frequently looked to. But the growth of green moss on the pots or the contained soil, which is usually looked on with disfavor, is beneficial unless it implies too great neglect of cleanliness, since the moss plants assimilate.

One other point deserves mention in this connection. All plants bearing leaves are constantly pumping water from the soil and giving it off into the air in the form of invisible vapor. While the amount of water thus evaporated from foliage is largely influenced by the structure of the leaves, which differs much in different kinds of plants, in a general way it may be taken as proportional to the leaf surface expanded. Our systems of warming dwellings in winter are nearly all open to the objection that the heated air within doors is far drier than the cold air without, colds being a very frequent consequence of passing from one to the other. During the winter, therefore, properly watered plants in our dwelling rooms contribute to no small extent to keeping their atmosphere from becoming too dry.

W. T. in American Florist.

DO VARIETIES RUN OUT?

By W. H. SHELMIER.

[Read before the American Carnation Society at Buffalo, Feb. 16.]

In the propagation of our green-house plants, it seems to have become the fashion to refer to the art of increasing them by cuttings as something unnatural, and altogether out of the regular run of events. Many florists have an idea that the cutting bench is diametrically opposed to nature's laws, and that our plants increased in this way must become weakened, sickly, and the varieties eventually die out by a continuation of the process. It is asserted that propagation is not reproduction, that it is merely the old plant reinvigorated, and from the necessity of the case the stock must degenerate. If the opinions held

are not quite so radical, there is still a general mistrust that rooting cuttings to perpetuate the life of a variety is merely a makeshift, and sooner or later resort must be had to the seed—the natural and true plan to perpetuate the species.

The object of this paper is to combat these suppositions, and, while I may not be able to entirely convince, I hope at least to throw out a few crumbs of truth which may give food for thought and further investigation. To my mind there is nothing opposed to nature's laws in the propagation of a plant by layers, cuttings, grafts, and so on. All phanerogamous plants are built on the same general plan. The grasses, trees, herbs and cultivated forms of our houses (the carnation being no exception) can all be reduced to ultimate similar parts. This ultimate part is known in botany as the phyton, and merely consists of the stem from joint to joint, and the leaf or leaves attached thereto at the top. A bud starts from the axis of the leaf and stem, reproducing the same plan, varied only in detail by the species; and from the seed to the death of the plant, growth is nothing but a repetition of the same process.

But this phyton, this plant part, is much more than a mere extension of growth. It is to all intents and purposes a new plant. It is not independent, because attached to the parent stem; but it is, nevertheless, a *unit*—so that a plant may be said to be a community of individuals, and is in reality as much so as a branch of living coral. Further, each part, each of these independent factors, is capable, under certain circumstances, of striking root and taking on a separate existence. This production of roots from the stems of plants is a general principle in the vegetable kingdom, and the foundation of the art of propagation. In a natural state the process is resorted to far more than a casual observer would suspect, and the plants produced thereby, whether in a state of nature or from our propagating tables, are as much a new existence—they are just as truly independent and resuscitated beings—as are plants grown from seed. Mr. Thomas Meehan, the veteran botanist, says: "If we take off a cutting and put it in the ground, it becomes as truly a new individual as a chicken raised from an egg."

The sugar cane rarely or never produces seeds, but has been increased by layers and cuttings from time immemorial. The banana is another example of a seedless plant. In neither case does there seem to be any lost vitality, although they have been thus grown for ages. Indeed, in cultivation the tendency is to entirely lose the power of producing seeds. Wild plants are increased by layers and cuttings in a state of nature, and examples might be multiplied without number.

Many herbs naturally annual are continued from year to year by means of cuttings as well as seeds, the common cardinal flower of our meadows being a prominent example.

But the author of "Carnation Culture" says: "Nature never propagated a carnation by cutting short an incipient cane from the side of the old plant and bid it take upon itself a separate existence." I would take exception to this statement, and make the assertion that it is not only possible but very probable nature has propagated the original native species in that very way. Of course it cannot be supposed that she cut the cane or pips by an invisible hand and inserted them in a bed of fine sand with bottom heat and all the modern accessories. But it is easily conceivable that a plant may become broken by wind or the tread of animals, and the parts thus partially broken or entirely separated take root and become new plants. I have observed in our houses when a stem has by accident become broken, the separated ends will callous and eventually emit roots in the air if in a damp and shady place. There is no trouble in saving plants thus rooted. Nature does not revolt at the production of plants by cuttings. The phenomena of the cutting bench are in strict accord with nature's laws. It is the business of the florist to beat the old dame at her own game. She, always prodigal, may be satisfied by rooting one cutting in a hundred or thousand. By strict observance of conditions we can turn out 75, 90 or 100 per cent, and they will be just as good as the parent—every one of them—if our work has been properly done.

I will now try to show there is in reality, as far as can be seen with the eye, no difference between a cutting and a seed. This may seem to be a startling assertion, but there is nothing more true than this fact. All plants grow by a multiplication of plant parts (phytons)—the one growing from the apex of the preceding one, until finally the branch bears flowers, bears fruit and forms seed—always borne on the end of the stem. Our microscopes reveal the fact that the embryo within the seed is merely a small phyton consisting of a stem (the caulicle), capable of taking root, and the minute leaves (cotyledons) which expand and produce a bud, which bud sends forth another stem and leaves—or plant part—and so on indefinitely. Note the fact that the stem of the embryo possesses no roots in the seed. These are developed when the seed is placed in the damp and warm ground, just as the roots of a cutting are produced from the lower end of its stem under like conditions. Too high or too low a temperature will make sickly and weak plants in the case of either a seed or cutting. And too much or too little water will totally destroy either the one or the other. The seed is a very wise provision of nature for bridging

over uncongenial seasons of the year or transporting the species to a distance. Yet there is a difference. It is necessary to the formation of a seed that sexual union shall take place in the ovary, and the product of the parts thus brought together partakes of the characteristics of both parents. Thus variation is produced, and without entering into a prolix explanation, it may be said in general that the greater the difference in the parents, the greater the variation in the seed. The seed is simply nature's method of producing variety. Again I quote from Thos. Meehan: "Individual good is not subserved by seed-bearing, but the union of two distinct cells in one insures variety, which is ever a leading object in nature." Here, then, is the secret opened up to us whereby improvement may be made. The carnation was found a fixed type of single flower generally reproduced by seed. Man began the cultivation of this plant 3,000 years ago, we are told, but he has not yet succeeded in eliminating the single flower from plants grown from seed. By the crossing of varieties and the selection of the better kinds, wonderful improvement has taken place until Jove's own flower is the rival of any in the market. The process of crossing varieties is one whereby we must discard the bad and hold on to that which is good, and when we have the better variety we must perpetuate it by cuttings. Without the seed we would get variation but slowly; without the cutting the improvement would be lost.

But after all we have said, we are still brought face to face with the fact that the varieties of carnations grown to-day are not the same as were grown a generation or decade ago. Old kinds discarded, new ones taking their places. And why, I would ask, should this not be the case? Without resorting to any theory of disease, we can readily see that better varieties have been produced to take the place of the old. A poor commentary it would be on our numerous hybridizers if this were not so.

Lizzie McGowan, Daybreak, Golden Gate, Aurora, etc., are taking the places of Edwardsii, DeGraw, Astoria, La Purite, etc., not because they are any more robust or in any way more capable of resisting disease, but because their flowers are better, larger, more perfect and bring a better price on the market. The old must of necessity drop out of the race and give place to their more perfect prototypes.

That varieties run out in six years I do not believe. It takes that long or longer to get a new kind fully distributed, and I am quite confident that many of the older kinds can be found to-day growing as vigorously as ever. There is nothing inherent in the plant whereby they should not be as healthy after 100 years of propagation by cuttings as when they first saw the light of day. Disease may indeed get

in its insidious work, but a seedling is just as liable to be so attacked as a kind that has been cultivated for years. Any one who has raised seedlings must have observed the sickly appearance many of the plants present.

It is a sorry thing to contemplate the fact that hardly one seedling in a hundred is worth saving, and that one may soon show signs of failing health. Many varieties in the very year of their introduction show more signs of disease than do those of long standing; and I would allude to Buttercup, Century, Wm. Swayne, Lamborn, Tidal Wave, and very many others if need be, as examples.

I believe this matter of running out of varieties lies entirely in our own hands. If we propagate carefully and judiciously, we can preserve them indefinitely. If we are careless, reckless and unobservant, they are lost to us forever. Many of the new introductions are spoiled in the beginning (and our entire stock may be ruined in like manner) by indiscriminate and reckless propagation. A good, healthy, fast-growing carnation plant will give us about as many good cuttings as flowers. But I am sorry to say there are too many of us not satisfied with the legitimate, but must resort to the reprehensible practice of cutting up the entire plant; and it is needless to add, the plants produced from the flower stems are, in my opinion, utterly worthless. They will either die at once or stretch out a precarious existence.

In conclusion, I would make an earnest appeal to all florists for the better education of ourselves, for those who assist us, and for those who come after us. I mean to say, we should be better educated to our calling; and an important part of that calling is to endeavor to find out the laws that govern our every-day operations. Science is not difficult to comprehend, and surely the pleasure to be derived from its pursuit will be alone ample compensation for the time thus spent. Of all the sciences, botany is of the most importance to us. Not the mere lisping of long Latin names, but the study of the hidden mysteries of plant life—growth of the seed, development of the embryo, structure of the stem and leaves, expansion of the flower, that culmination of nature's skill. Such studies will not only afford us pleasure, add unto us length of days and afford needed recreation, but will put into our pockets dollars—the great bauble which we are all after.

POULTRY-RAISING.

To be a farmer's wife and not keep poultry is the exception to the rule of exceptions. Such a condition does not exist, for every farm has its flock of chickens, usually supplemented with turkeys, ducks and geese.

Beef, pork and mutton enter largely into the formation of what we call our daily bread, but when something specially dainty and appetizing is required, the flock of poultry is called upon.

It is almost impossible to estimate the profit of an ordinary farm flock—the profit usually being wholly estimated upon the worth of the fowls and eggs sold. It is seldom that the possessor considers the worth of the fowls and eggs used at home.

The flock is entitled to some consideration for its economy in utilizing much of the waste material about the farm, and again they should be accorded some praise for the destruction of large numbers of insects.

The different methods of raising poultry are as varied as the opinions of men. To make a success, one must have healthy fowls and comfortable quarters for them. The quarters need not be expensive, but should be comfortable in all weathers.

A straw shed, well banked on the east, north and west, is very comfortable while the bitter cold of winter lasts, but when spring approaches, the banking has settled until it leaves a six-inch air space all round just under the eaves, and a driving rain or spring snow makes it anything else but comfortable. The melting snow on top finds plenty of places to leak through and forms a continual drip for weeks.

The straw banking is a first-class home for rats, and the youngsters hatch out about the same time the early chicks do, so that by the time the chicks are growing nicely, they disappear mysteriously; no one knows what becomes of them. If that straw banking is torn down there will be no further need of mystery; great numbers of half and full-grown rats will be found, and rats are particularly fond of spring chickens.

If lice once get a start in a straw hen-house, nothing but fire will drive them out.

The inside arrangements of a hen house should be made movable, so that in cleaning out or white-washing the nests and roosts may be easily carried outside.

A child's broom is far better to use in white-washing than a white-wash brush.

We keep lime where our fowls can have free access to it, and almost any time in the day there may be seen one or two or more fowls picking over the lime pile.

Charcoal is another essential; the fowls need it. Sharp grit they must have or they will not remain healthy very long; many a chicken dies with cholera, simply for want of grit, or gravel.

I am often asked which is best—to set hens on the ground or above the ground. I think there is little difference where she is placed: if she has good fresh eggs and is not molested, she will probably make a good hatch.

A setting hen ought to have a nest large enough to turn around in, but not so large that she cannot gather the eggs up under her and keep them snug and warm. If a nest is so flat that the eggs keep rolling out from under the hen every time she moves, they will get chilled one at a time, and the consequence is a poor hatch.

Setting hens should be dusted heavily with insect powder two or three times during the three or four weeks it takes her to bring off a brood of chickens, for lice cause great uneasiness to setting hens.

The plans for rearing young chicks are as different as the people who have charge of them.

Last spring The Western Poultry Breeder, of Topeka, Kas., offered a prize to the lady who would send in the best article on "How to feed and care for young chicks." I do not know how many ladies entered the contest, but eleven different states were represented. As I sent in the winning article, and as I practiced my own preaching last year with good results and intend to again this year, I will give you here all or nearly all of the article as I wrote it nearly a year ago:

HOW TO FEED AND CARE FOR YOUNG CHICKS.

Allow the chicks to remain in the nest until thoroughly dry and lively, until they can stand alone and begin to scramble out from under the mother hen.

Examine the hen and chicks all over for lice; look carefully, and if any trace of them can be found, dust with pyrethrum, both the hen and chicks. Keep all grease, oil and turpentine away from them.

Pyrethrum is a yellow powder, and can be bought at any drug-store for ten cents an ounce.

Have a warm, roomy coop placed on the sunny side of some building, put some soft straw on the bottom of the coop, and on this carefully place the mother hen and wee chicks.

Give for the first feed light bread slightly moistened with sweet milk. We have tried the hard-boiled-egg plan, also the feeding of custard to very young chicks. With me they have proved entire failures with both chicks and little turkeys. Well-baked corn bread may be given occasionally for a change; feed the soft part just as it is, but moisten the crusts in sweet milk enough to make them crumble. Feed every hour the first week.

Give to drink either milk or water. Don't give it to them in a saucer, but get a sardine can. There are usually plenty of them lying around, but if none are in sight you can get them empty from the restaurant for the asking. Melt the cut top off. Those holding a pint are the right size. Cleanse frequently if milk is used.

Do not allow any other fowls, dogs, and especially cats, to go near the brood.

Keep sand or small grit where the chicks can have free use of it.

The second week, feed every two hours and begin to give more of a variety, though not too much, and give what the chicks will eat readily every time. To keep the chicks growing they should be ready for their feed at each meal-time. Have a small yard in front of the coop, in which the chicks can run about.

When they grow strong enough to follow the mother hen, give them their freedom after the—in the morning.

If a chick can be kept alive until it is three weeks old, it will be very apt to live until grown. Have their coops made proof against rats, also keep cats at a safe distance. Keep the chicks out of strong winds; everyone knows enough to keep them out of the rain.

All disturbing influences should be kept away from them; a sudden fright is very detrimental to the welfare of a young chick.

As they grow older, gradually extend the time between meals, and give more grain—wheat, both boiled and raw, cracked corn, oats, etc.

Where there are several hens, and they do not fight each other or each other's chicks, it is a good plan to have a large yard fenced off for them in which the grass is kept short. The coops can be arranged along the fence or in the house if one can be built in the yard. In this yard have a feed-pen made of lath, so that the chicks can go in and out readily. The ground inside the pen will soon become packed, and the feed can then be thrown upon it. It will need to be swept clean quite often. Fresh water is necessary at all times. After chickens are one month old they will need to be fed only three times a day.

These were the plans that the judges considered best, and I have found them the best of several different ways I have tried in the care of very young chicks.

The returns from the sale of poultry, eggs and butter is the farmer's wife's pin-money, though just what pin-money is in these days is a problem hard to solve—groceries and dry-goods, odds and ends, that there is no accounting for, are taken home in the buckets and baskets that went to town filled with eggs.

Missouri annually ships many car-loads of poultry to the eastern markets, the handling of which furnishes employment for many of her people. There is hardly a small town along any of our lines of railroad but what has its poultry and egg market.

The raising of thorough-bred fowls has reached enormous proportions; all grades of humanity engage in it. I doubt not that the small boy who has a pair of chicks with a goods-box hen-house in some back yard, becomes as enthusiastic over them as Vanderbilt over his establishment with a \$15,000 hen-house and chickens to match in costliness.

Out at Kansas City there has recently been established the first national poultry farm, incorporated under the laws of Missouri. The real estate, buildings, fowls and appliances represent \$50,000.

There is no class of people so well situated as our Missouri farmers' wives to raise thoroughbred fowls.

In North Missouri, especially, we are in the heart of a red clover region; blue-grass and red clover grow wild along our fences and upon waste land; grain is cheap, plenty of good water, and everything necessary for the development of poultry life of the highest types.

But "there is never a rose without a thorn." The one serious drawback to the improvement of even our common farm-yard fowls is the exorbitant rates of expressage. It is not merely a question of dollars and cents a few resolute people pay who are determined to have choice poultry, but it is a detriment to the farming communities. People who are willing to pay a fair price for good stock to improve their flocks are balked in the attempt, at the very beginning, on account of excessive express charges. "Double merchandise rates for all live poultry not intended for market," is the worst enemy the improvement of farm fowls ever had. Every poultry fancier in the State or out of it will tell you that he could double his sales in a single year if it were not for that one clause in express rates, "Double merchandise rates for all live poultry not sent to market;" and on account of it the farmer's wife goes on from year to year longing for the improvement in her fowls that those few words debar her; and on their account the people are obliged to show to their visitors the old, original barn-yard fowl.

If we could have single express rates for thorough-bred fowls, it would create the grandest improvement our farm fowls have ever known.

I advertise in one of Missouri's most popular farm journals, and every season brings me scores of letters from ladies on the farm who are anxious to improve their common fowls, but say they cannot afford it because the shipping costs so much.

Give us single express rates, and it will be only a short time until every woman on the farm will point with pride to her improved poultry.

The poultry business, from a business point of view, is not unlike other callings. It also is in-marked with successes and dotted here and there with failures. The grandest successes, however, have often been preceded by the sorriest of failures.

There are, I believe, about three hundred papers published in the of poultry, pigeons and pet stock, and nearly all journals of agriculture have a department for poultry. Some of the poultry papers have special departments with an editor for each. They have their regular contributors, special artists, critics, chronic growlers and peace-makers, and are conducted on much the same principles as are other papers.

MRS. MARY TAYLOR.

Hale, Mo., Lock box 171.

ORNAMENTATION OF OUR COUNTRY HOMES.

By L. A. GOODMAN, Westport, Missouri.

The distinctive difference in our country homes I can no more plainly show to you than to cite you to the wide difference that exists, not only in our portion of the country, but which I see everywhere here in California, and that is in the homes of our stock men, and peculiarly our agricultural portion on one hand and those of our horticulturists on the other hand.

A man whose whole time and interest are devoted to the breeding and raising of cattle, horses, mules or sheep can scarcely find time to spend a day or a dollar on his yards and gardens in the way of ornamentation, whereas the horticulturist never fails to find time and means to beautify his yards. But it is something practical that my subject calls for, in helping to awaken an interest in beautifying our homes and how to do it. What I have to say will not be new to many of you, and yet it is the same old story of "line upon line."

Our country home varies from that planted in the native forests surrounded by many old trees, perhaps evergreens, a large yard in grass where the horses are often turned to graze, or the chickens and hogs are allowed to roam at will, to that of the pioneer on the prairies without a fence or a tree about the home, where oftentimes not even grass is to be found, and horses, mules, cattle, sheep, hogs and chickens can "go as you please." Between these two we have all grades of houses and yards, some pleasant, some agreeable, some tasty, and some even handsome and picturesque. I do not wish so much to instruct the horticulturist, or to induce him to plant, as I do to awaken an interest in the minds of many of our country home-keepers that much taste can be displayed in the planting of our new and old places, and that it can be done so easily.

First, then, if it is necessary, and I am sorry to say it is, we will have a fence—not a heavy fence, but one just as light and low as the circumstances will permit. So many of our yards are spoiled with their fences; in fact, if it could be possible, I would like to see the fences abolished entirely, but as this cannot be done, do the next best thing and make them as light and airy as possible. Next, let us have a green lawn. A good set of blue-grass forms the most beautiful of all yard fronts. Sloping or rolling, as the case may be, it matters not if we only have it well covered with a good grass sward. The position of the home from the road is a very important matter, for if we have our house too far from the road we will have more lawn than we will take care of, and it will cost too much to plant it properly, and hence we find so many places so sadly neglected.

I have found that the greatest drawback to the pleasant planting of our country homes and their ornamentation is a want of knowledge of what to do and how to do it easily. The farmer is so busy that he has but little time to give, and little knowledge, and no thought on the subject, so that it is no wonder he lets the matter run at loose ends. I have found in many instances where I have met such a friend and such a place, that after a half hour's talk with him on how to beautify his place with but little trouble and less expense, invariably he was induced to do it. But, above all this, if we can get a love of outdoor life and the beauties of our trees, we have a lever to work with that will move the hills, rocks and stumps and make a yard. Then, if we can suggest some easy means of reaching the desired end, we may be sure that there are many who will adopt it. A house standing about 100 feet to 150 feet from the road, and, if on a corner, about the same distance from each road, will give any farmer all the room he will need for the front yard.

Do not plant in regular order, but by all means plant in clumps or groups, leaving a bare spot of lawn and a clear view from the house to the road, especially from the principal windows of the kitchen and sitting-room. Plant a clump of evergreens here, a clump of shrubs there, a clump of one kind of deciduous trees here, another kind there; a bunch of a variety of hardy herbaceous plants in one bed and a bed of roses in another.

These, being of common varieties, cost but little and are soon planted. But what I want to warn you against is indiscriminate planting. If you have not enough time and money to plant all at once, do not, I pray you, do not by any means plant a tree, or bush, or rose, or shrub, just as the notion happens to take you, or just because you see that there is room between two other trees to put it. Such planting will make your yard a mixed medley, and will be a tangled mass of trees, shrubs and vines in the years to come.

If you cannot plant your yard at once, and wish to keep planting as you find things which suit you, or as they are given you, plant judiciously and with system; have a plan and follow it. Have your clumps of evergreens, deciduous trees, shrubs and roses, and when you do plant any of each of these, plant it in its proper place with its proper kind, and in after years you will be glad. Another mistake, and a very great one, is in thinking that there is no beauty except in a large tree or trees and shrubs. Now, the beauty of them is in seeing them grow and caring for them until we come to love them as we do our children. Plant then, small and young trees, and plenty of them, so that the growth may gladden your eyes and hearts every time you return to your homes.

Does your heart go out in love to your home and your children when away from them? do you love to have them about you, on your back, maybe, loving and caressing you? Well, if so, you can realize how much a true lover of trees and plants thinks of the ornamentals of his yard. These trees and shrubs will grow in your affections and the affections of your children until they come to love every tree and shrub in your yard. Don't you believe it? Well, just try and cut down a half-dozen of them because they are too thick or are spoiling one another, and have your wife and children, as I have had, pitch onto you, and scold and beg for the lives of the trees, because you are cutting down their friends.

I well remember an instance where a large old white oak had been for years, and the American ivy covered it to a height of sixty feet (where it had been sawed off), until it was one solid column of green in summer and scarlet in autumn, how every one in the whole country

admired the beautiful column, until it seemed as if it were a part of the beauty of our village. One day a heavy storm came, and it was laid flat on the ground. The people in passing could not be kept out of the yard, but would come in and express their sympathy for the old tree, as for a lost friend. Pardon the digression. I am anxious to show that the best investment we can make is to plant a few trees in our yards and let them grow with our children, and our love with them. In my own home, I think more of my trees than I do of my house, and I have a good one, too.

TO PLANT CHEAPLY.

Plant a clump of elm, a clump of sugar maple, a clump of soft maple, a clump of white pine, a clump of Norway spruce, a clump of red cedar, a clump of shrubs, Althea, Weigelia, snow-ball, a clump of lilacs, a clump of spirea, a bed of roses, hybrids and June, a bed of peonias, phlox and hardy perennials, and, if you can afford it, a bed of house plants. These, put out in proper places, so as not to interfere with the view from the house, will, with very little expense, give a very pleasant yard. Small evergreens can be had one foot high for ten to fifteen cents; trees two years old, of the varieties given, at about the same price; shrubs, two years old, at five to ten cents; roses at fifteen to twenty cents; herbaceous plants at five to twenty cents. The total expense of such planting of such a place need not exceed \$10 to \$15, and will prove the best investment a man ever made on the farm.

The roads and paths should be as few and simple as are needed only, because they take more time to keep them well than any other thing on the place. A drive from the gate, circling or straight, to the side of the house, and thence to the barn, with a path from the front gate to the front and side of the house, is all that is needed. This path if angling or curved will be much the better, but never so much so as to cause a person to turn out of the way in going from the house to the gate.

The back yard may be used for indiscriminate planting, and many things not proper to go into the front yard can be used in the rear, and without so much system. In fact, it may be a mixed mass or a conglomeration if you choose to have it. Plant thickly, and if some die you do not miss them, and as soon as they begin to crowd, take them out by transplanting or cutting down. Do not be afraid to cut down *when* necessary, any more than you are to plant *where* necessary. On my own place I have cut down twice as many trees as I have left, and will have to do more of it.

The planting of larger places, or ornamentation of city homes, is not in the province of my paper, and yet I cannot help but notice the great mistake that the city people are making of letting their places be so much crowded as to spoil their beauty. I find that to be the case much more so in California than even in our own State. One fine, well-perfected tree, with plenty of green lawn, makes a prettier show than a dozen planted too closely, and one well-grouped clump of trees is much more beautiful in a lawn than would a dozen scattered here and there. If you do plant thickly or indiscriminately, be sure in after years to begin your thinning in time.

Ornamenting our country homes can be very much assisted by road side planting. Not by any means planting in single lines of trees about the roads, but if the road is straight, then, by all means, plant the trees in groups along the road ; and at every corner, especially, make a clump of trees. If the road is irregular or is very winding, then one, or still better, two or three rows of trees along the line, lends much beauty to the drive. But one straight line of trees along a straight road is too much of a sameness, and especially so if the land is very level.

Such planting adds very much to the beauty of our country homes and its tendency is to build up and elevate the tone and character of our people. A roadside planted in groups gives a very pleasing effect to the traveler. And then you all know that trees do so much better when growing together than in single rows. A road with a clump of elms here, a clump of maple there, one of white ash, one of pine, one of larch, one of sycamore, one of spruce and one of cedar, will give such a delightful sense of relief to the passer-by that he invariably falls in love with the surroundings.

I wish that I might arrange a plan of planting and have a cut made, with the number and varieties of each kind of tree, which would be of some assistance to those who would learn ; but it is with this matter as with many others with which the horticulturist has to deal. He is a teacher and a preacher to every one whom he meets, both by example and precept. I believe that he is the most liberal-minded of all our public men, and is able and willing to give advice without money and without price, and yet the people will not always follow.

I have given directions for the most simple manner of improvement for our country homes, because in my own practical work I have found such advice to be most generally followed, and have never yet failed when talking to a farmer in convincing him of the real money value of such an investment, and have invariably had him follow it.

A word or two about forming our lawns and I am through. I have always had the farmer plow up the whole yard in the fall, level and harrow well, as he would for a flower-bed. Sow wheat and then timothy—if in spring, sow oats—and then blue-grass, two bushels per acre, and in the spring two bushels more per acre. I do this that we may at once get a green yard, and then when the wheat is cut we will still have a green surface, and that long before the blue-grass forms a sod. By the second or third year the blue-grass runs out the timothy, and we get a good sod by mowing only two or three times a year, which is about as much as I find the farmer willing to do.

Do not understand that this plan of forming a lawn or planting trees can be applicable to our towns or cities, or even many of our larger farmers, but it is the only practical way of improvement of our country homes, and we may be sure if thus once started, the love for it will grow and grow until it has found something better.

Every one who visited San Rafael will remember with delight the long winding road up to the top of the hill where we got the view of the ocean and bay, and there on the top what a delightful view lay before us in the valley, and how judiciously the planting had been done in clumps and clusters all over the whole hill. Hon. W. T. Coleman planted better than he knew when that was done, and the 375,000 trees which he planted have been so beautifully arranged in clusters and groups that they add an hundred-fold to the beauty of that beautiful landscape which lay before us on that morning. I called on those near me at the time to be careful to notice the beauty of the planting while they were admiring other things. Well, this was just the object-lesson I wanted to give, and the one I wanted to illustrate in my paper.

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